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TRADE ROUTES TO WESTERN CHINA.

On the 5th of this month the present writer sent the editor of this magazine some very interesting notes which he had received in a letter from Mr. Ney Elias, writing from Bamó full of hope and high spirits, just before starting (9th of January) to meet his friend Margary. The next day I heard, with grief indeed, of the disaster which had befallen the party. With Colonel Browne and Dr. Anderson, Elias is, I trust, unhurt; but the friend whom he had rejoiced to meet under such singular circumstances—the young Englishman who had just successfully accomplished the feat of travelling from the China Sea to the Irawadi, a feat which had hitherto baffled so many gallant attempts—has been treacherously murdered. There is hardly anything sadder in the history of travel. Margary is not indeed, like Hayward, a martyr to geographical enterprise, but (better than that) a martyr to his duty as an English public servant. And it is a pity that the Minister who had to answer about him in the House of Commons showed that he had not the slightest conception who this sufferer might be! Mr. Grant Duff sometimes vexed our Anglo-Indian souls with what seemed to us untimely optimisms; but sympathy as much as knowledge would have secured him, and would have secured Mr. Bourke also, against such stumbling.

I see that General Margary in a letter to the *Times* (March the 9th) quotes a telegram in which "the nephew of Lee-See-Hie" is named as the leader of the band that committed the crime. This man *Li-si-tai* or *tai-hi* is often mentioned in the reports of Major Sladen and Dr. Anderson. The former calls him a dacoit or freebooter; but, in fact, he seems, from what Anderson says, to have been a leader of the Chinese Imperial party, who held his ground resolutely against the Muhammadans, and struck at them, and at all whom he supposed to be their friends, from his fastnesses midway between Momien and the Irawadi. The jealous Chinese traders at Bamó stirred him to oppose the advance of Major Sladen's party, and he was believed to be the author of the attack made upon that party just before they reached Momien. Now that the *Panthés* (Muhammadans) have been crushed, one can understand that this personage may be somewhat rampant, and may have gladly seized the opportunity to wreak his vengeance for former failure on the new English mission. But this can hardly be more than one element in the tragedy, and if royalty has been cognisant, one may hope that royalty may yet learn the lesson for which the elder Boswell commended Cromwell, to the infinite disgust of his guest Dr. Johnson.

I write these notes, at the editor's request, to accompany a map which I shall not see till it is published. I must assume that it will contain all that is needful, as shown in the map before me, which is Colonel Thuillier's of 1870—"Eastern Bengal, Burmah, and parts of China and Siam, on a scale of 32 miles to the inch."

The chief races occupying the region should be briefly noticed. The Chinese have spread according to their manner, either by actual migration or by assimilation of previous occupants, over a considerable part of the lower lands between Yunnan and the Irawadi. The Shans, the widely diffused race, of whom the Siamese are a great offshoot, always tolerably civilized and broken into a vast number of small principalities, subject to one or other of the neighbouring monarchies, are older occupants of those lower lands, as they were once of the better part of Yunnan itself, and of the Upper Irawadi Valley. The higher hills towards the Irawadi are chiefly occupied by tribes of half civilized Kakhyens or Kachyens, the same race that on our Assam frontier call themselves, and are called, *Singphos*, *i.e.* in their tongue "Men." Burmese appear to be few in number even on the Irawadi, so high up as Bamó. There are many tribes besides those we have named, but an attempt to detail them would be inappropriate to our present object.

Tali-fu is a central point, on which nearly all the routes of which we have to speak converge; and for ages it has been the base of all operations, military or commercial, from the side of China towards Burma. It may still be regarded as the western capital of Yunnan, as it was in the days of Marco Polo, who gives it the Mongol name of that province, *Carajang*. For many centuries before Kublai conquered it (A.D. 1253), Talifu had been the seat of a considerable Shan kingdom, called by the Chinese *Nan* (or Southern)—*Chao;* this latter term being a Shan word for prince, which still figures among the titles of the kings of Siam and all the other states of that wide-spread race. During the recent brief independence of the Muhammadans in Western Yunnan (probably themselves as much Shan as Chinese in blood) Tali again became a seat of royalty, and here reigned Sultan Suleiman from about 1860 to 1873, when the city was captured by the Imperialists and the Muhammadans were massacred. The Sultan himself took poison, but his head was sent in honey to Peking. Tali overlooks a fine lake and

an extensive treeless plain. Lofty mountains rise behind the city, covered with snow for nine months out of the twelve. The lake, which stands at 6957 feet above the sea level, is 24 miles in length by 6 in width: it discharges by a short stream into the Mekong, and the local story goes, no doubt fabulous, that boats have come up to Tali from the ocean.

From Tali towards the Burmese capital one chief road runs direct; the rest make westward for the nearest points of the Irawadi, at and about Bamó.

The direct road is that by THIEN-NI (in Shan, *Muang Tsenvi*), formerly the seat of a considerable Shan principality. This road has never been traversed, nor has Thien-ni been reached, by any European. In the spring of 1865 Captain C. E. Watson, and Mr. Fedden, of the Geological Survey, were within about one march of it, but the place was then in the hands of an insurgent chief, and they were obliged to turn back. Mr. Fedden's map places Thien-ni in about 23° 17′, a good deal further north than it is in my map of 1855, but no doubt much nearer the truth. The road from Thien-ni runs to the secluded Shan principality of Kaingma, and thence to the Chinese city of Shunning-fu, called by the Burmese Shwen-li, and by the Shans Muang-chan.* About Muang-Ting, on the road between Thien-ni and Shunning-fu, is a very unhealthy tract which the traders push through as rapidly as possible. The road then crosses the great Mekong by an iron suspension bridge, and thence runs on to Tali. The whole distance from Mandalé to Tali by this road is about 35 marches. It was by this Thien-ni route (so it is stated in the *Geographical Magazine* for January last, p. 22, and I believe, correctly) that Colonel Browne's party was originally intended to proceed, and deeply it is to be regretted that the intention was thwarted, as it was, by the Burmese King. The insurgent movements upon that line afforded him a pretext to allege, justly or unjustly.

BAMO, in latitude 24° 16′, stands on a high bank over the Irawadi, on its eastern side, about 2 miles below the entrance of a considerable stream called the Tapeng River.† It is a small stockaded town of unburnt brick, chiefly populated by Shans, but with some fifty or sixty houses of Chinese. Here, or hereabouts, has long been the water terminus of the land commerce from China, and as early as the famous world-map of Fra Mauro at Venice, terminated in 1459, we find a rubric on the Upper Irawadi (though that name is unknown to him) which runs:—*Qui le marchavantie se translata da fiume a fiume per andar in Chataio;* "Here goods are transferred from river to river to go on to Cathay." And in the first half of the 17th century there is some evidence of the maintenance here of an English factor by the East India Company. The staple of the imports from China has always been the silk of Szechwan, in return for which cotton is carried back from Burma, but many minor articles swell the aggregate of trade.

At or near Bamó, a variety of paths quit the alluvial valley of the Irawadi, here extending some 20 miles on the eastern bank, to traverse the broad belt of the Kakhyen Hills, which rise in the summits to 5000 feet and upwards, whilst the passes reach nearly to 3000. Thence the paths descend into cultivated and populous valleys, occupied by Shans and Chinese settlers, and drained either by the Tapeng and its branches, or by the tributaries of the Shwéli further south. The best known of these routes is that by which Major Sladen went to Momien. This route, at starting from Bamó, crosses the Tapeng by ferry, and keeps to the north of that river for the greater part of the way. It passes Ponlain in the Kakhyen Hills, Sanda in the valley of the Tapeng, Muang-la, and Nantin. At the latter place several other routes from the Irawadi fall in; one by the Hotha Valley, which, after quitting the Irawadi plain, keeps throughout to the south of the Tapeng, and another from Sawaddi,* a small town on the Irawadi, 8 miles below Bamó. This route passes through Muang-wan (Mowun of the Burmese, Long-chuen of the Chinese), on a tributary of the Shwéli, and is said to be the easiest.

The first line is that most largely used by the Chinese traders at Bamó, and they have expended a good deal of money on improving it. The Sawaddi route is, however, also much used, and in January it was intended that our expedition should adopt that line. But as the attack upon it is reported to have taken place at or near Manwain (probably Muang-wain) in the Sanda Valley, it is evident that a change in the plans must have occurred, and that the expedition must eventually have taken Sladen's road. The chief stronghold of the hostile Chinese partisan leader, Li-si-tai-hi, already spoken of, was at Maphu, on this road, between Muangla and Nantin. From Nantin the road ascends rapidly by a series of stepped valleys to Momien, which is estimated by Dr. Anderson to stand at 5800 feet above the sea. The whole distance, as travelled by Sladen's party, was 120 miles from Bamó. On the way between Nantin and Momien a large extinct volcano (Ha-shuen-shan) is passed.

We have no account that I know of, except meagre native itineraries, of the road beyond Momien. Yungchang-fu is reached in four marches of about 60 miles in all. It is alleged that the difficulties of the road become much greater beyond Momien, and this seems probable from the very aspect of the map. For here the road has to pass athwart that formidable fascis of great rivers, descending from the highlands of Tibet, which give to the map of this region an aspect so unique in geography. Between Momien and Yungchang, the Shwéli and the Salwen (the great river which enters the sea at Martaban) are crossed, the former by a suspension bridge, the latter by boat.

Yungchang-fu, the Wuncheng of the Burmese and Yongsang of the Shans, is the chief mart of Western Yunnan. It was the *Vochan* or *Unchan* of Marco Polo, and was in his time the seat of the Mongol garrison which occupied the country of the half civi-

* This triple nomenclature applies to all places on this frontier, or nearly so.

† This river is notable in the history of geography. For before any modern European had seen it, Klaproth, in working out his theory of the identity of the Sanpu of Tibet with the Irawadi, had convinced himself and half the geographers of France and Germany that this Tapeng was the real channel that brought in the Sanpu. But when the river was once seen—first, I think, by Colonel Hannay, the theory would literally no longer "hold water."

* This is no doubt the Indian classical name Srâvasthî, or (in Pali form) *Sawatthi*, belonging to one of the cities most famous in Buddhist legend, and the ruins of which, on the banks of the Rapti, in Northern Oudh, have been identified and explored by General Cunningham.

lized tribe whom he calls by the Persian name of *Zar-dandán*, or "Gold-teeth"; a tribe whose identity it has not yet been possible to ascertain satisfactorily. A road from Yungchang joins the Thein-ni route at Shunning-fu.

Tali-fu is distant from Yungchang about 112 miles by the Burmese itineraries, occupying six to eight marches. Marco Polo makes it five only, but, considering the nature of the country, they must have been very stiff ones. In this interval the great Mekong, and two other considerable rivers, are crossed by iron suspension bridges.

There is a route to Yungchang from the Irawadi by the Shwéli Valley, but I can find no information regarding it. Though the river is not navigable for any great distance, it is a large one, and, flowing as it does through a broad valley, one would expect it to afford facilities to a road. Yet we do not hear of it as one of the frequented trade-routes.

From Tali to the provincial capital Yunnan-fu is reckoned at twelve stages, and the Burmese itineraries make the distance about 200 miles. Yunnan-fu has been visited and described by Garnier. It suffered much in the Muhammadan insurrection, when its populous suburbs were entirely destroyed, though the *Panthés* never succeeded in capturing the city itself. It is, however, the natural centre and mart of a country abounding especially in mineral wealth, and has probably ere now regained much of its former population and prosperity. It stands at a height of 6400 feet above the sea, on the shores of a great lake, not less than 70 or 80 miles in circumference.

Mr. Margary appears to have reached Yunnan-fu by a route through Kwei-chau, of which an account would have been most valuable, but it is scarcely to be supposed that his journals have been saved.

Whatever may be the destiny of the route of issue from Yunnan by the Tongking waters, of which the French have formed, with reason, so great expectations, at present the most important route from Yunnan-fu is that to Siuchau, the head of the Yangtsé navigation. It is reckoned to form twenty-four stages.

Formerly there existed a very important trade-line from Yunnan to Canton, which involved little more than twenty days of land travelling; taking up the navigation of the southern or Nanning-fu branch of the Si-kiang or West River of Canton. The navigation commences at *Pé-sé-p'u*, a place that I cannot indicate on the map, but which appears from Biot to be in the Ssengen-fu department of Kwangsi. The voyage thence to Canton is of twenty days, down stream. The road of late years, owing to the disorders in Kwangsi, has been entirely abandoned; but "the metals of Yunnan, the jade and gems of Burma, the musk of Tatsienlu, and many other articles of that remarkable through-trade which passed through Yunnan from west to east, went formerly by that route."*

Returning to Tali, we find another important trade-route running, as straight as may be in such a country, from this to Chingtu-fu the capital of the vast and wealthy province of Szechwan. It passes through the city of Ning-yuan-fu, in a region as yet utterly impenetrable to foreign travellers, at the head of the charming valley of Kienchang, which is undoubtedly, as Baron Richthofen has lately shown, the long-sought *Caindu* of Marco Polo. This road falls into the Tibetan official road from Chingtu to Bathang and L'hasa at the eighth stage from Chingtu. Richthofen attempted to travel this road, but after he had got successfully about half way to Ning-yuen, the outrageous aggression of a body of Chinese troops, and its consequences, compelled him not only to turn back but to abandon any renewal of the enterprise.

Another road from Tali leads north through Likiang-fu to Bathang on the Tibet road; indeed there are two lines, one on either side of the Kinsha-kiang.

The road by which Francis Garnier and his party reached Tali-fu in the beginning of 1868, is apparently not a trade-line of importance, They started from Tong-chuen in Northern Yunnan (latitude 26° 25½'), where Captain Doudart de Lagrée was left ill, crossed and recrossed the great elbow of the Kinsha, or upper course of the Yangtsé, and thence struck the upper end of the Tali Lake. As has been said before by the present writer, "a more daring enterprise of the kind has never been effected by any nation; though Colonel Pelly's ride to Riadth bears some resemblance to it."*

Let us now briefly recapitulate the travellers who in modern times have chiefly aided to augment our knowledge of the field we are treating of. I do not attempt to include the Roman Catholic missionaries: they have been numerous, but what they have contributed is not readily accessible; nor in good truth have they of late years effected much for geography in this field.†

I begin with Blakiston and Sarel, who were the first to reach the head of the Yangtsé navigation, ascending by boat from Hankau in 1861.

The French expedition just alluded to, after tracing the great Mekong upwards from the sea, entered on our field at Kiang Hung (or Xieng Hong) the capital of the Shan principality so-called, in latitude 22° 0', which had been reached from Maulmain years before by Lieutenant, now General, William Macleod. The French passed up through Southern Yunnan to the city of that name, and thence to Tong-chuen, as we have just mentioned. There their gallant leader died, in the absence of Garnier and his detachment. On the return of the latter the party proceeded, bearing the body of their captain, to Siuchau, whence they descended the great Kiang.

T. T. Cooper, in 1868, made a gallant attempt to reach Tali and the Burmese frontier by taking the Tibet road from Chingtu-fu, *viâ* Bathang. But he was forced by the Chinese to return from Weisi, a town lying betweeen the Kinsha and the Mekong, about 120 miles north of Tali. His subsequent vigorous attempt to penetrate to Tibet from Assam scarcely comes within our present subject.

Major Sladen, Dr. Anderson, and Lieutenant Bowers reached Momien, during the Muhammadan régime there, from Bamó in May 1868, and were the first to cross the Chinese frontier in that quarter. This expedition, owing to circumstances needless to touch further here, by no means added so much as might have been hoped for to accurate geographical knowledge.

Messrs. Watson and Fedden, as has been said, had

* Richthofen's Letters.

* *Ocean Highways*, 1874, p. 488.

† The work of Abbé David is not within our field. M. Desgodins has done something, but his friends at home have rather mishandled his data.

reached within some 20 miles of Thein-ni in 1865. Though travelling in a country previously unexplored, these gentlemen have managed to make their reports in the highest degree difficult to read, and do not convey very clear impressions of the nature of the country.*

Baron Richthofen's bold attempt to travel to Tali, and its defeat, we have just recorded. It is but a small item in the record of his vast services in the scientific exploration of China.

Finally, Mr. Augustus Margary has achieved a memorable place in the history of geography by his journey accomplished from the China Sea to the Irawadi, *viâ* Kweichau, Yunnan-fu, and Momien.

It would be scarcely reasonable to conclude this over-hasty sketch without a few words as to the commercial objects of exploration in this quarter. That even in such objects the reward will be considerable I doubt not, but I confess that I have never been able to enter into the very sanguine expectations that some hold and largely propagate upon this subject. Nor do I see much to modify in words that I used four years ago in addressing the Geographical Section of the British Association at Edinburgh on this question:—

"Many startling and inconsiderate statements appear in the memorials and other documents which have been addressed to Government on the subject of the new routes for trade with China, as, for example, when the agitators of the question talk of thereby opening up a new trade for our country with 200 millions of people occupying extensive and rich portions of the earth, as if, forsooth, the trade and products of a vast and varied portion of the earth's surface, merely because that portion happens to be described by one name, as CHINA, were like water in a lake, which may all possibly be drained dry, if but tapped at a single point in one of its narrow creeks. . .

"The probability of a great attraction of China trade to the ports of Pegu, even if there were a good highway opened out to the Chinese frontier, depends, not on rhetorical statements about the vast population and products of the Celestial Empire, but (and here I will borrow a felicitous expression, which I remember to have been applied in India, by that admirable public servant the present governor of Jamaica, Sir John Peter Grant) on the question where the *trade-shed* of that produce shall be found to exist—a question on which I have never seen any great light thrown. As regards the important part of the export trade at least, we have to look, not to Yunnan and Kweichau, which are in the main mountainous regions, but to Szechwan. I observe that Mr. Cooper, a sensible, and on this point quite unprejudiced observer, does consider that a large part of the produce of Szechwan would seek an outlet by the Irawadi, if the land-route were again open. Looking to the length of land-journey from the fertile portions of Szechwan to Bamó, this opinion certainly surprises me. . . . My own impression is that the Yangtsé, in spite of all the difficulties of its upper reaches, as being free from the complications of a double frontier, and the anarchy of tribes imperfectly controlled, will carry to the sea, for many years to come, the produce of Szechwan and Central Yunnan, rather than the outlet by Burma or the Shan States*. . . . .

"What I think we may reasonably hope for is this:—First to see Western China tranquilized, and the old channel of trade restored and stimulated, by the access of British steamers to Bamó; secondly from gradual but inevitable political change in our own relations to the Burmese Government, I should expect to see our own influence brought to act, either in the suppression of marauding, or in opening out by engineering the short road to the Chinese frontier cities, unhampered by such paltry obstacles as the intrigues of Burmese underlings, or the jealousies of Chinese traders; and I venture to think that our Government, as a general rule, need neither grudge the small cost of surveys and explorations beyond our frontier, nor *hesitate to apply some degree of pressure on native governments to sanction such measures, without which these governments are apt to think us not in earnest in our proposals.*"

These conclusions about the over-sanguine views of the promoters of the new routes were come to so reluctantly, that I was almost sorry to see the views which I had expressed in 1871 afterwards so strongly and unconsciously corroborated by a traveller so sagacious and so accomplished as Baron Ferdinand von Richthofen. Look at his paper, touching this subject, in *Ocean Highways* for January 1874.† I will extract but a few lines:—

"It is to be regretted that the expedition of Major Sladen, in 1868, which had to overcome so many difficulties and hardships, did not proceed further than Tang-yue-chau (Momien).‡ The real difficulties of the road commence east of that place. I have had to converse with several Chinese traders from Ning-yuen-fu who had been over it. They spoke in the most impressive terms, accompanied by emphatic gestures, of the long and steep up-hill and down-hill country which must be travelled over in crossing, first the two branches of the Lan-tsang-Kiang (or Mekong) and then the Lu-Kiang (or Salwen). . . . To render the existing roads . . . . available for any kind of modern means of transportation would involve an enormous expense. The engineering difficulties even of constructing a railway, although of terrible magnitude, might perhaps not be insuperable. But to justify such a

* Those who make such an unreasonable outcry against the Indian Government for attempting to establish a scientific and systematic orthography, had better study this pair of Reports (*Selections from Records of Government of India in Foreign Department*, No. xlix., 1865). It is only by a laborious and tedious collation of the reports of the two gentlemen named that one can even discover when they are speaking of the same places. Thus the *Laigyah* of Watson is the *Ledya* of Fedden; *Myik-ngai* of W. is *Myid-ngé* of F.; *Maing-Tzeit* is *Mine-zaik*; *Maing-yau* is *Mine-yaw*, and so forth. It is necessary to draw prominent attention to these things: the amount of public money that has been wasted in India on un-edited or ill-edited publications is frightful to think of. The "*I have the honour to be's*" that have been printed and published would half outfit an exploring expedition. And what a figure do such confusions make in the eyes of foreigners! Captain Watson can only speak of Talifu as "the capital of the *Shan Taroks*." What jargon this is! and yet if rationally elucidated it might convey valuable information. For the words mean "Shan-Chinese." Does this mean that the Tali Muhammadans are of Shan blood?

* I here must omit remarks on what I cannot but still regard, as I have always regarded, as the preposterous project of a railway to Kiang-Hung or its vicinity from Pegu.

† Baron Richthofen had expressed like views more cursorily in his letters published at Shanghai in 1872.

‡ I believe this was, under all the circumstances, quite impracticable.

gigantic enterprise the prospective profits should be equally gigantic. This would perhaps be the case if a continent occupied the place of the China Seas, and the commerce of China had to take its outlet by way of Bamó. But under existing circumstances, the attempt to divert the trade of Szechwan to Bamó would be equal to the attempt to make the waters of the Yangtszé flow up stream."*

H. Yule.

A JOURNEY FROM SAMARKAND TO SHEHRI-SEBZ AND BOKHARA.

The town and province of Shehri-Sebz, the "Green City" of olden time, and birthplace of the mighty conqueror, Timur-Leng, was five years ago known to the outer world only through an obscure veil of hearsay and fiction. But, in 1870, this veil was rudely rent by the same Russian bayonets who had hastened to protect the Amir of Bokhara against his unruly vassals, and what the princes of the ruling dynasty on the Zarafshan had for more than a century and a half been unable to achieve, was accomplished by a race from the far north, alien alike in tongue, in religion, and in ideas. The freaks of Fortune are curiously inconsistent, and most thoroughly is this feature exemplified herein, that the cradle of the former conqueror of Moscow, who had slain and led into captivity thousands of Muscovites, should, after a lapse of more than 500 years, be, by Muscovites, sought out, conquered, and opened up to the knowledge of the civilized world. It was not, however, in a retaliative spirit that the Russians acted, but in order to oblige an ally. The rebellious Jura Beg, who is at present kept in durance in Tashkend, had followed an example set by many of his predecessors, and acted upon by him on many previous occasions, and revolted against his liege lord. But the latter was now friend of the great "White Czar on the Neva," who does not suffer an ally to be wantonly assailed, and punishes those who resist his authority. The Russians, under General Abramof, came, saw, and conquered, but immediately withdrew after peace had been restored. Little was thus added to our knowledge of Shehri-Sebz, and it was not till last autumn that further information was acquired, when three Russians—M. N. Majef, editor of the *Turkistan Gazette*, M. Krivtzof, a photographer, and M. Bektchurin—made an excursion into the Shehri-Sebz Valley, which is a little under 13 German miles from Samarkand.

The province of Shehri-Sebz in Bokhara consists of three districts, Kitab, Yakobeg, and Shehri-Sebz or Kesh as it was formerly called. The latter communicates with Samarkand by means of two roads, one of which passing through the Cham gorge is practicable for carts, and was used by the Russians on the occasion of their expedition in 1870, while the other, which is suitable for horses, ridden or led, and is half the length of the former, passes by Kara-Tepe through the Tachta-Karaje Pass, and emerges hard by the walls of Kitab. The first halting-place is Kara-Tepe, which during the Russian war against Bokhara was made the centre of the Amir's operations; it is surrounded by high mountains, and is situated a short distance from Samarkand. After leaving the *rāyon* of the last-named town and passing the Anchon-Arik Canal, cultivation gradually diminishes, and before the traveller's eyes there extends a wide steppe studded with brambles and thickets, bounded by an imposing panorama of mountains. Straight ahead may be seen the Hilan Sai Range, and the pass of the same name through which a narrow path leads to Karchi. To the left rise the dome-shaped summits of the Penjkent Range, and beyond them lies the mountainous region where the Zarafshan takes its rise, while behind the traveller the green-topped table-land of the gardens of Samarkand appears to merge into a boundless steppe. The road now takes a turn through a country strewn with rocks and boulders, and seamed with mountain torrents. By-and-bye, villages come in sight, and the land becomes cultivated, the medium, however, being only rain and not irrigation canals. The ground rises towards the Hilan Sai Range in terraces. The road winds round a spur of the mountain, and from the highest point of a small pass hard by one gains a fine panoramic view of the whole steppe country. From hence to Kara-Tepe it is about a league, but it is bad marching on account of the steepness of the road, and the numerous stones with which it is strewn.

After leaving Kara Tepe, the fortifications of which were destroyed by General Abramof in 1868, the traveller has before him the mountains of Kitab, which are traversed by a narrow pass called Kette-Sai, through which flows a small stream, while the road shifts backwards and forwards, first to one side of the stream and then to the other, but, nevertheless, is not difficult for horses. Not a vestige of life is to be seen, except in the few instances where, in the ravines, some grass has sprung up, and here one lights upon some solitary Kirghiz tents. The track becomes steeper, the stream grows fainter and disappears into the depths below, and the highest point of the Tachta-Karaje Pass is reached, an open spot about thirty paces in circumference, and just above grow some bright green lime trees of diminutive growth, from the boughs of which hang some primitive offerings, placed there by travellers, overjoyed at having overcome the difficulties of the road.

From the village of Kara-Tepe to the ascent of the pass is 3 leagues, while the distance from the top of the pass to the village of Kainar on the southern slopes is about 7500 paces. With few exceptions, the path is here wide enough for horses, and as one leaves the surrounding rocks, and approaches the gardens of Kainar, it widens out considerably, till a view is gained of the whole valley of Shehri-Sebz, and of the gardens dotted about the towns of Kitab and Shehir, which are girt with a common wall. In spite of the famed fertility of this district in the middle ages, the Russians could see nothing at the present day even equal to the fertility of Khiva. On three sides it is hemmed in by groups of mountains, and only on the western side, where the Kashka-Daria issues out, can the eye reach the distant horizon. The road passes first by a poor village, which even in the dry season abounds in miasmatic swamps, while in autumn and winter the whole plain is under water. It is divided from Kitab by a small plain, through which flows the Kashka River, a stream which, under the walls of Kitab, assumes the character of a mountain torrent. On crossing it one comes upon the wall encircling

* *Ocean Highways*, p. 406.

Kitab and Shehir, and the Russian travellers entered through the very breaches made by their countrymen in August 1870. A narrow street, half under water, leads to the citadel of Kitab, between which and other Central Asian towns there is not a pin to choose. It boasts a square, a bazar, narrow, dirty, and poverty-stricken; in fact, the only point of interest in Kitab was that the Russians happened to hear, amid the din of Tartar music, the words of command given in their own tongue — "Na Plecho!" (Shoulder arms); "Slushai! Na Kaŧaûl!" (Attention! Present arms!).

Similarly, in Affghanistan, one may hear "Right about face!" "Forward!" and other tokens of European influence. Ten years ago I was not slow to recognise in these words the first early symbols of western civilization, and now the traveller from the south will discern in the Russian words an unmistakable sign of the approach of that mighty power to the north. Who can say whether the close of another decade may not hear the words of command of both tongues mingling with the roar of cannon and the din of battle?

To return, however, to the description of the Shehri-Sebz Valley. The Russians fully confirm previous accounts of the extraordinary marshiness of this part of Central Asia. After a slight rain the streets of Kitab are a foot deep in mud, which the tropical heat of the sun cannot dry up. On the other side, the soil is irrigated by means of numerous canals and streams drawn from the Kashka Daria, and in point of fertility the valley is not surpassed by the famous district of Mijankal on the Zarafshan. Between Kitab and Shehri gardens, meadows, and cultivated plots of ground occur in unbroken succession, and fruit is especially plentiful. Indeed, were it not for the warlike spirit with which have been imbued all Central Asian races since the earliest times, the native land of Timur would probably be now more densely populated than it was even in his day.

Shehri, the second city of the valley, is rather larger than Kitab. A broad and commodious highway leads from the latter place to Shehri, which from being situated in a plain (in contrast to Kitab, which is on hilly ground), is rather cleaner than its sister city. It is famous for the ruins of some state buildings dating from the time of Timur, foremost among which must be mentioned the palace of Aksarai, on which the worthy knight Don Ruy Gonzales de Clavijo, ambassador of Henry III. of Castille to the court of Timur, tells us that the builders and artificers had been engaged for twenty years at the time of his visit (1405). The Spaniard speaks in terms of admiration of the broad and high entrance to the garden, which was beautifully adorned with glazed tiles, in blue and gold, as well as of the beautiful galleries and reception halls decorated with gold, azure, blue, silver and ivory.

The Russians found these ruins still very fine, and most interesting. To the south lies the dome which once crowned the building, and which can still be recognized, though it has fallen apart from the walls, which are covered with the remains of elaborate mosaics, inscriptions, and other decorations. Adjoining one of these walls is a poor building through which one enters into the citadel, which is larger than that of Kitab, and is garrisoned by Bokharian troops. Here the Russians accidentally met with the Amîr Muzaffar Edin, whom I had met twelve years before. But he must be much altered, for instead of a spare man with black hair, he seems to have changed into a gray-haired veteran inclined to corpulence, while his clear blue eyes appear to have lost some of their old fire. His glance, voice, and general appearance and manner recall, however, much of his pleasing address, though he has grown nervous and irritable, and stutters at the commencement of a sentence. To the Russians he was, as might be expected, very courteous, and hearing that there was a photographer among them, allowed himself to be taken in different postures, an act which formerly had to be practised in the strictest secrecy. Only the fortunate circumstance that Muhammad had not discovered the art of photography could have emboldened a prince of the true believers to take such a step. Twelve years ago, in Bokhara, the unhappy possessor of a portrait of a living human being suffered the extreme penalty of the law—and now a viceroy allows himself to be taken! *Tempora mutantur!*

The Russian travellers returned by way of Karchi and Bokhara, a route which, as far as concerns the portion between Shehri-Sebz and Karchi, deserves notice. We must mention first Yakobeg (detached gardens), a place which lies north of the Shehri-Sebz Valley, and formerly belonged to that district, but has since been incorporated into Bokhara proper. Through Yakobeg runs the road which connects Shehri-Sebz, with the northern khanate of Hissar, by way of the Kelte-Minar and Chatchak Passes. As far as regards the name Yakobeg, it is no longer in use, though Colonel Yule has not exactly erred in placing it on his map of the Upper Oxus. Kelte-Minar means dwarf tower, and on emerging from the pass one lights upon a ruined caravanserai, out of the *débris* of which may be seen protruding a low tower. From native accounts the route from Yakobeg to Hissar is made up as follows:—

Yakobeg to Yar-tepe	. .	3 tashes
,, Kelte-Minar	. .	7 ,,
,, Kara Kaval	. .	6 ,,
,, Chatchuk Pass	.	6 ,,
,, Baissun	. .	10 ,,
,, Dinai	. . .	9 ,,
,, Hissar	. .	9 ,,
Total	.	50 tashes = or, 7 days' journey.

As far as my recollection goes, my informants told me the distance was much less.

On the road from Shehri-Sebz to Karchi may be seen to the south the clear outlines of the Hissar Mountains, four days' journey distant. The range dividing the basin of the Kashka-Daria, from that of the Zarafshan has now disappeared on the horizon to the north-east, while the Hissar Mountains gradually fade away to the south. One again emerges on to the steppe region, which is fertilized for some distance by the Kashka-Daria. But gradually culture diminishes, and the dwellings assume a poorer aspect till one approaches Karchi, where luxuriant cultivation again gains the upper hand. Karchi and Shehri-Sebz thus form the agricultural centres, and the former is also a place of some commercial importance. For a century and a half it has been the second city in the Khanate of Bokhara, and were it not for the constant broils of the Afghans and Uzbegs, which prevent any regular communication with India by way of the left bank of the Oxus, it would some time in the course of this century have outstripped Tashkend. A. VÁMBÉRY.

THE ITALIAN EXPLORERS OF NEW GUINEA.

Although so fully occupied with the preparations of your grand Arctic Expedition, which appears to have thrown into the shade even the mighty doings of the 'Challenger,' I venture to hope that the following items of news of the doings of our travellers, Beccari and D'Albertis, both of whom are now in all probability exploring, in opposite directions, the vast and little known land of the Papuans, will be of some interest.

To begin with Beccari, I will remind you that when I last wrote (vide *Geographical Magazine* for 1874, p. 236), he was at Kandari, exploring a nearly untrodden corner of Celebes; since then he has left that island, but not before meeting with other unpleasant adventures, which happily enough ended well; the following letter of his, which I translate, will tell the tale:—

"Makassar, 30*th August* 1874.

"Several days since I returned from the excursion of which I spoke to you in my last, but it was of no advantage to my collections. On the 15th of May I left Kandari in my boat, with six men and provisions for a month. Favoured with a land breeze, we were soon out of the inner harbour, which, from the outside, has all the appearance of a river. The land breeze at Kandari is often very strong, and is to be felt at a considerable distance from the shore. Nearly every morning a thick mist rolls down the bay, and slowly vanishes towards nine or ten o'clock. I believe that the fact that the mangroves, and other trees, which skirt the shore, are covered with long *Usneas*, very unusual in these countries, except on the mountain tops, may be fairly explained by the occurrence of that daily fog.

"As we proceeded, the land-breeze fell, and, after an hour's lull, the wind blew from the sea, and, carried by it, we entered the bay of Mar-Amu, anchoring behind a small island named Wawosondu. The rajah of the *Tokkias* had lent me one of his men, well acquainted with this locality, and known to its inhabitants, who are also *Tokkias;* thus I had nothing to fear from them. In those days a large party of head-hunters were said to have come down from Kanawi; I was therefore told to be watchful. They are not, however, so very formidable, and it suffices not to be alone or unarmed, for they do not dare to attack anyone capable of the slightest defence. As far as I am personally concerned, I am convinced, on account of the impression I have made on the first of those savages who saw me, that my beard is sufficient to frighten them off. Probably, none of those *Tokkia* have as yet seen a white man, and much less a long-bearded one. But the case stands very differently with the pirates, who may surprise us at any moment: with them the presence of an *Orang putih* (white man) is always associated with that of rich booty. On account of the pirates the coast is wholly without inhabitants, and I should therefore be obliged to live in my boat; an excursion up one hill soon convinced me that there was indeed little to collect. I therefore recrossed the outer bay of Kandari on the morning of the 17th, and anchored near the small island of Bokori, off Cape Ripa-Ripa. I had been told that that strange megapode, the *Malleo* or *Megacephalon maleo*, was common in that island; but it is likely that the natives mistake true *Megapodii* for the *Malleo*. There being no primeval forest I did not stop at that place, but turned Cape Ripa-Ripa, with the intention of going to Lembò, near the island of Labenki. The land wind had fallen, so that we were obliged to use our oars, but not being able to overcome the strong current of the Sampara River, we cast anchor at Saba-pulo, a small harbour. Up to the 24th I vainly tried to cross the mouth of the Sampara: the wind was always dead against me, and I could not get northwards. That day I was joined by five Bughis *prahus*, coming from Kandari, from whom I learnt that the pirates were at Lembò, where they had killed some of the Kandari people. The five *prahus* were all armed with swivel-guns or *lelas*, and were on their way to apprise their friends of the approach of the pirates. Of course I had to give up all idea of proceeding to Lembò, and commenced my retreat on Kandari. The next day (25th) I returned to Saba-pulo, and there I landed with three men in the small boat, leaving the other three to take care of the *prahu*. I ascended a hill with the intention of seeking the huts of the Alfuros, in order to obtain, if possible, fresh provisions. I was crossing a paddy-field, and had not yet reached the huts of the Alfuros, when gun-shots were heard from the direction in which my boat lay, but more to the westward: there could be no doubt about it, the Kandari *prahus* had fallen in with the pirates. After a while the firing ceased; one of the parties had given in, perhaps the pirates were advancing. I had no time to lose; I rushed headlong down the hill in hopes to save my men and my boat; those who were with me could hardly keep up with me on account of their bare feet. After losing some time in disengaging the small boat, which was high and dry amongst the mangroves, we at last reached my *prahu*. I at once ordered two of my men to proceed in the small boat to the mouth of the inlet in which we lay, to try and find out what was going on outside, while I and the rest prepared and loaded our weapons—these consisted in an Albini rifle, a double-barrelled, breech-loading, large bore rifle, loaded with explosive bullets (excellent for sinking the light piratical boats), and a couple of revolvers; my men were each armed with a double-barrelled fowling-piece, a spear, parang, and kris. The small boat soon returned with the news that seven small piratical boats were in sight, making for where we lay; my men had hardly got on board when they hove in sight, rounding the headland on our right. Seven piratical *prahus* could not contain less than seventy men, ten times our number! We lay 200 metres from the shore, there was ample time for a retreat that way, but I preferred to try my chance otherwise. '*Audaces fortuna juvat*' has ever been my favourite motto, and even this time I had not cause to repent having followed its impulse; but at that moment my thoughts flew to you. Only the thought of falling alive into the hands of such a cruel and brutal set might have made me pause an instant. I next ordered the anchor to be heaved, and the prow to be turned towards the enemy. My only chance was to meet them separately; to have attempted to outrun them would have been folly. Five of the hostile *prahus* had meanwhile approached, and I was about to open fire at 1000 metres, in hopes to intimidate them with the long range of our arms, when my men informed me that the approaching *prahus* appeared to belong to Kandari. They were, in fact, those we had met the preceding day, and on getting nearer we recognised the people on board. All apprehension had ceased. We got alongside to hear the news: it was they who had attacked the three piratical *prahus*, two of which were those seen by my men in the boat; the Bughis had not pursued them, because ten other piratical *prahus* were in sight. There was, therefore, no time to lose. We turned back. At Bokori, behind Cape Ripa-Ripa, we fell in with a fleet of Kandari *prahus*, with the rajah on board: having heard the firing they had put out to our assistance. Next day we arrived at Kandari; the whole place was topsy-turvy, for the pirates were expected in the night, and it was supposed that they would have landed on the opposite side of the peninsula, and, crossing the hills which separate Saba-pulo from Kandari, taken the village in the rear and burnt it. Most of the people had carried their goods to the boats; I, instead, had mine carried from the boats to the house, for I did not credit the rumours which were afloat.

"On the 27th, however, the pirates did approach Kandari, and arrived at the small island of Bokori; several of the Bughis *prahus* went out to meet them, but finding them too numerous did not dare to attack them, and sent back for reinforcements. The next morning I went out with ten *prahus*, all armed with small brass cannon *(lelas)*. We got in sight of the enemy, but as soon as the pirates perceived our number, they retired towards Saponda-laut, and we could not pursue on account of the strong contrary wind which had meanwhile arisen, for the rowers were not enough. We therefore returned to Kandari.

"After what had happened I could no longer think of venturing alone in my boat out at sea; I therefore went to Lepo Lepo. The months of May and June had been so rainy that very little had been done for the collections. At Lepo Lepo I now turned my whole attention to plants, and I employed the latter half of June and the whole of July in describing from live specimens. During these botanical researches I ascertained more and more the slight individuality of the Celeban flora. I do not think that I have found a single new genus; nearly all the species collected may be referred to Bornean and Molluccan forms, and, if different, they are always nearly allied. Some Indian plants, which do not figure in the Javanese flora, reappear in Celebes. As over large tracts in that island the forests have been destroyed, there is a predominance of those plants which I do not consider indigenous, but of recent immigration; thus, for example, the *Compositæ*, the *Convolvulaceæ*, the *Labiatæ*, the herbaceous *Leguminosæ*, the *Ciperaceæ*, the *Gramineæ*, &c. However, I have explored but a small portion of Celebes, and it may be that other parts are richer in endemic plants.

"Meanwhile, as several Bughis *prahus* had agreed to sail in convoy to Makassar, I was able to send news concerning our blockade by pirates. The evening of the 7th of August, as I was returning from botanising, messengers arrived from Kandari with the news that a Dutch steamer had arrived enquiring for me. The same night I started, and next morning I was on board the Dutch war steamer 'Sumatra.' Lieutenant-Commander Holtzapfel was most kind: he had brought my letters, papers, and provisions. He offered at once to give me a passage to Makassar, and on my telling him that I should require a few days to pack up my collections, he most kindly consented to wait. On the arrival of my letter telling about the pirates, there were no men-of-war at Makassar, but as soon as the 'Sumatra' came in she was at once despatched by Governor Bakkers to Kandari. I have, therefore, every reason to be extremely grateful to the Dutch Government. On the 10th we left Kandari; we vainly tried to hear something about the pirates in the Muna Channel; on the 13th, after some hydrographic and surveying work, we touched at Bonthain, South-west Celebes. Bonthain Peak must be about 2000 metres in height, and I suspect that it is a volcano; the doubt came on seeing pebbles of lava in the village, and in remarking that the fertile valley around presents a black mould so characteristic of decomposed lava. Up to now I believe true volcanoes have only been found in Minahassa, North Celebes; it would be therefore of great geological interest to investigate the true nature of Bonthain Peak. On it, at about 1000 metres above the sea, is a small sanctuary. On the 14th we reached Makassar."

The letter I have translated is addressed to Marquis Doria; in another, bearing the same date and addressed to Count Salvadori, Beccari gives some interesting ornithological news. The woodpecker, a rare bird in Celebes (we are on the frontier of the woodpeckerless Australian region), is considered sacred by the Bughis; the merchants keep the dried skins in their coffers, under the belief that they will bring money thereto. The hornbill is also venerated, and its head is hung up in shops for the purpose of attracting buyers. From Makassar, Beccari proceeded to Surabaya, and thence to Batavia and Buitenzorg; at the latter place he spent some time in the magnificent Botanic Garden, studying the rich collection of plants in that herbarium. On arriving at Makassar, he had received the funds so generously placed at his disposal for a second journey to New Guinea, by the mayor and provincial council of Genoa, and at once began his preparations for the voyage. He left Batavia for Ternate on the 18th of October, it being his plan to procure a boat there and sail thence for Geelvink Bay. On the 12th of November he wrote from that place, where he had been very cordially received by the Dutch Resident Van Mussembroek. We all thought Beccari already on his way to North Papuasia, when a letter came from Amboina, dated December the 7th, in which Beccari told us that he had not succeeded in getting a boat at Ternate, and had therefore gone to Amboina, and there had nearly settled to hire the 'Burung Laut,' the schooner in which he went the first time to Sorong.

The last mail brought in other letters of our friend, dated up to the 9th of January; he has been most successful in his natural history collections, not only at Ternate, but in the neighbouring islands, where he sent hunters; nine big cases are on their way here, and they contain, besides other collections, about a thousand bird skins, a very complete series of Amboina fishes, and that zoological rarity, an entire specimen, in alcohol, of the pearly nautilus. He received a most valuable donation of rare Papuan and Malayan bird skins from Mr. Bruijn, an officer in the Dutch Navy. At Amboina, on the 9th of December, *en amateur*, he took four good sights at the transit of Venus; the planet appeared like a crown piece on a white surface; the exit was most distinct. He has succeeded in hiring the schooner 'Deli,' the former one not having kept her appointment. He was to leave on or about the 20th of January, and thus he has, in all probability, reached New Guinea long ere this. Beccari proposes exploring the north-west extremity of New Guinea. He will first visit the islands of Geelvink Bay, return to the Arfak Mountains, and thence push eastwards as far as the Ambernoh River, which he intends to try to ascend, in order to reach the high mountains which overlook Utanata. If circumstances admit he will also try to reach Humboldt Bay. Mysol, Battanta, Waigin, and Salwatti will be probably visited on going or on the return voyage. Beccari is well provided with instruments, provisions, &c.; he has with him seven Amboinese hunters and bird-stuffers, most of whom have had ample collecting experience with Wallace, Rosemberg, Bernstein, and Meyer. He writes to me that he intends also giving special attention to ethnology, and we may confidently expect very interesting results from this, his second expedition to Papuasia. He believes that he will be back at Ternate towards the end of October.

I cannot close this letter without giving you the last news received from D'Albertis, who, as you probably are aware, left Naples on the 10th of November last, together with a Signor Tommasinelli of Genoa; they both intend exploring the southern coast and eastern extremity of New Guinea; and, before leaving, D'Albertis told me that his plan was to lay his head-quarters at Somerset, Cape York, and thence to take the earliest opportunity for reaching New Guinea; he appeared to rely somewhat on missionary boats, which now frequent that coast. In a letter written from Batavia at the end of December, he tells us, however, that he had purchased a boat at Singapore, but had not succeeded in getting any men. The boat was to follow him to Java, where he had been unexpectedly detained on account of the non-arrival of cases he expected from London; he feared that that delay would oblige him to stop a month at Somerset. At Singapore, on his way out, or rather at Johore, D'Albertis had fallen in with Miklucho Maklay, the distinguished Russian naturalist and traveller; he was preparing to journey right through the Malayan peninsula, in hopes of being able to investigate the true nature and affinities of the *Sámangs*, which he believes to be of Papuan origin. In fact he, Meyer, and Beccari, advocate the unity of the Papuans and the Asiatic Negritoes, in which, up to the present, I am loth to believe.

HENRY HILLYER GIGLIOLI.

SOME WORDS ABOUT NEW DANGERS AT SEA AND ERRORS IN CHARTS.

No subject can well be of deeper interest to all connected with navigation than the discovery of new dangers at sea, especially if far from land; and it is therefore surprising with what recklessness, and on what insufficient grounds reports of such discoveries are sometimes made. Even when there is no doubt as to the fact, the data supplied to determine the geographical position are too often most vague and unsatisfactory.

The worst evil of such illusory or insufficient reports is, that when once a doubtful danger gets a place on our charts, it is extremely difficult to disprove its existence in a satisfactory manner, and even then there always remains an unpleasant doubt whether it may not, in fact, exist, although not in the assigned position. Our charts have at present far too many of such "vigias," or doubtful dangers, scattered over the ocean, none of which a ship approaches with any feeling of security, although it is pretty certain in the majority of cases the supposed danger has no real existence. Indeed the vicinity of one of these in bad weather can hardly fail to add considerably to the anxiety of the navigator.

The subject of the discovery of dangers is treated of in Raper's valuable work on navigation, pp. 359-364, where brief directions are given for guidance; but they appear hardly to receive from seamen the attention they deserve. Indeed Raper's book is not yet in such general use as it deserves to be, the far less perfect work of Norie still holding its ground from various reasons. In this book the subject is not referred to, and in the Admiralty manual it is disposed of in a few lines.

It may not therefore be out of place to discuss the subject at some length, pending the issue of authoritative instructions, which are much to be desired; and it is proposed to consider in this paper, in the first place, the recorded causes of false reports and alarms, and then to point out how the navigator should proceed to verify the existence of a supposed danger; what steps he should take to determine and record its position; and how and to whom the report of the discovery should be made. Another not less important matter to be dealt with, will be how the navigator should proceed on discovering an error in a published chart, or what he considers to be an error.

A general rule, which should be made obligatory, may here be indicated, and the words of Raper can hardly be improved.—"No commander of a vessel who might meet unexpectedly any (hitherto unknown) danger, could be excused, except by urgent circumstances from taking the necessary steps both for ascertaining its true position, and for giving a description as complete as a prudent regard to his own safety allowed"; to which may well be added "or who makes a report of a shoal without having taken proper steps to place its reality beyond a doubt."

It may be well, at this point, to give some recent instances of the unbusinesslike reports here complained of. The following are taken at random, from last year's newspapers, and are of course not put forward as the only cases which have occurred during the year:—Firstly, here is a good specimen from the *Homeward Mail* of 12th of September:—

"One of Them.

"The 'James C. Stevenson,' while on her voyage from Galle on August the 8th, when nearly opposite Kalutara, and 3 miles off the land, running at 9½ knots, suddenly struck a rock amidships. So great was the shock that for a minute or two the captain and officers quite expected they would have to cut away the masts, but on sounding it was found no severe injury was sustained. A smash among the crockery seems, in fact, to have been the only bad result, although passengers lying on the skylights at the time were nearly thrown over on to the deck with the force of concussion. There was not a trace on the captain's chart of any rock near the place where he struck—nor indeed within two miles."

This is very incomplete, no bearings are given, the position only vaguely indicated, and it does not appear from the report that a *single cast of the lead* was taken, either before or after the event—the only sounding in fact seems to have been made by the carpenter, of the ship's well, to see if she made any water. It says she struck a rock *amidships* and passed on, which is almost unprecedented. If credit be attached to this report, a search "nearly opposite Kalutara" (probably Caltura of the Admiralty chart) might occupy weeks before the rock was found or its existence satisfactorily disproved. The ship was probably much nearer the land, or else one feels disposed to attribute such a shock to a large fish: soundings taken directly after the event would on that coast have been conclusive as to the distance off shore. Of course the original report in all these cases may have been more complete. No notice had been received at the Admiralty of this report up to January, 1875.* Secondly:

"Supposed Rock in the Atlantic.

"The *Baltimore Sun* of the 30th of October says:—'The curious yarn of Captain Picasso, of the Italian bark 'Teressa' *(sic)*, which arrived at Queenstown, Ireland, on October 2nd, from New York, to the effect that he had sighted on the 9th of September a large rock in latitude 40° N., and longitude 62° 18′ W., has occasioned much comment, but little credibility. The existence of 'rocks' in the Atlantic at various points in and bordering on the Gulf Stream has been reported on various occasions before, and they have been designated on charts, but scientific investigation has invariably shown them to be myths. The 'rock' of Captain Picasso is quite effectually exploded by Captain Putscher, of the North German Lloyd steamer 'Berlin,' now at this port, who states that on the 16th of September, in 41° 1′ N., and 60° 43′ W., he sighted a floating object, copper mounted, which proved to be the wreck of a vessel about 130ft. long; and Captain Uhdütsch, of the 'Braunschweig' also of the North German Line, reports having sighted on the 8th of September, in 39° 37′ N., and 61° 7′ W., a floating wreck from 160 to 170 feet in length. The differences of location are accounted for by the difference in time of the observation, and the drifting of the Gulf Stream, which at this season drives rapidly north. The differences as to the dimensions of the objects are of little consequence. That the rock of Picasso was the wreck observed by the two German captains there seems hardly room to doubt, and it is considered likely that it was one of the victims of the hurricane of the 7th and 8th of September.'"—*Times*, November, 1874.

No comment on this is required; a man raising an unfounded alarm of fire in a crowded theatre is hardly a worse offender than the originator of such a report as this. It is, indeed, fortunate that the "rock" was seen by other and more competent observers than the master of the 'Teressa.' The lead seems not to have been thought of.

* Since the above was written a reef is officially reported 2 miles off shore near this place.

The third instance is also from the *Homeward Mail*, and of the date 12th August.

"The steamer 'Scotia,' when steering for the port of Coconada, on July 4th, with Hope Island Lighthouse bearing north-west, and distant about 19 miles, suddenly struck soundings on a shallow patch, and got on successive casts of the lead 7, 6 and 5 fathoms, and after the last cast there was no bottom found at 20 fathoms. This would indicate a shallow patch to the south-east of Hope Island, and in a position where no soundings are marked on any of the existing charts. As this occurred at 3 A.M., no discoloration of water could be seen at that early hour, for on a spot with so small a depth as 5 fathoms, it would be naturally indicated by the colour of the water especially when surrounded by great depth."

This is said to have been reported to the Madras Government. It is also very unsatisfactory, although at first sight it appears plausible. It appears as if the lighthouse was in sight at the time of the occurrence, whereas the light in question is only 83 feet above the sea, and consequently not visible at the outside more than 15 miles; and no data are given as to how the ship's position was ascertained, or whether the ship was stopped for the lead, &c. Further, the report was made to the *wrong authorities*, or perhaps it was the Madras Government that should have known where to forward the report, for up to January 1875 no information on this discovery, if it be one, had reached the Hydrographic Department in England. These instances must suffice for the purpose of illustration.

ILLUSORY APPEARANCES.—The following are the principal appearances recorded, which have been mistaken for dangers; they are given as gathered together by Raper, with some additions from personal experience. The list does not, however, pretend to be final, or preclude the possibility of the existence of other similar causes.

In a moonlight night, when blowing fresh, it is easy to fancy breakers and shoals, especially when on the look out for them. Effects of light and shade have so much resembled breakers as to raise alarm; and sunbeams in the horizon seen through rain have been taken for rollers.* The shadow of small clouds on smooth water, especially if it be of pale green colour, or muddy, often exactly resembles a reef of rocks. Clouds and fogbanks often resemble land so much as to deceive an experienced eye. The vapour line near the margin of ice in the polar regions is always taken for land by novices.† Many reported islands or shoals, of which the accounts given have been apparently circumstantial, have, doubtless, been trees, fish (alive or dead), or ice islands, or even a water-logged derelict vessel. Phipps‡ records that he took a small piece of ice covered with gravel for an island. Weddell§ states that it was only on passing 300 yards from an ice island that they ascertained it was not solid land, but ice covered with black earth. He also mentions having taken the swollen carcase of a dead whale for a rock. An iceberg,‖ which had turned over unperceived, presented a new surface covered with earth and stones, so like an island, that nothing but landing on it convinced the observers to the contrary. A supposed rock* has turned out on examination to be a large tree covered with weeds and surrounded by fish. Whales† have probably been taken for rocks. These fish float at the surface for a long time together, and being covered with barnacles, grass, or sea-weed, exhibit an appearance so like that of a rock, that it is often difficult to believe the contrary. Raper quotes two special instances of well-informed officers being so deceived, one of them the great hydrographer, Sir Francis Beaufort. The writer of this paper had a rock reported from aloft, in a place where none was known to exist, which, on steering for it, turned out to be a wreck, bottom up, and covered with barnacles.

The sound of breakers or of surf has often been found to be caused by a shoal of fish. Kerguelen‡ saw a large shoal of small red fish that had the appearance of a sandbank of the extent of 2 leagues, on which the sea was breaking, and the illusion was rendered the more complete by the great number of birds that accompanied it. Captain Fitzroy also observes that a shoal of fish seen under the water may have given rise to a report of a bank, which it much resembles. Weddell records being alarmed in a fog by a cry of breakers, for which a noise produced by fish was taken. Reports of shoals have also frequently arisen from the collision of vessels with whales or other large fish. The writer remembers a report of bottom being obtained, owing to an albicore darting at the lead, which passed through his gills, and the fish was thus captured.

It has been remarked that it is very difficult at a distance to distinguish straggling ice and breakers from each other. A sound like that of guns§ is produced by the splitting of large masses of ice.

The surface of the sea in some parts of the world is occasionally found streaked for leagues together, by a matter which produces the "discoloured" aspect of shoal water, generally supposed by sailors to be the spawn of fish. This appearance is often startling even to those who have frequently seen it, and in those seas especially where coral reefs abound, demands a degree of care in approaching it. Banks of seaweed may be another such deception. The colour and appearance of these discolorations is very various, and the false impression is much strengthened when, as is often the case, a hasty cast of the hand-lead only is taken with the ship going fast through the water, and an imaginary depth "sung out" by the man in the chains. Raper observes, in conclusion, very justly, that accounts of new land or dangers, which are published from time to time, are not to be received without extreme caution, unless they state some circumstance which is decisive.

But the question of what is decisive does not admit of a short answer: as a rule, *seeing* only an appearance of danger cannot of itself be considered conclusive, without *feeling* it, either by the lead, or by landing on it. The cast of the lead must be satisfac-

* Voyage of H.M.S. 'Sulphur.'
† Sir James C. Ross.
‡ Voyage to North Pole in the 'Racehorse,' and 'Carcase' (*sic*), 1773.
§ Voyage towards the South Pole, 1822.
‖ Sir James Ross.

* Wilkes' United States Exploring Expedition.
† Horsburgh.
‡ *Relation d'une Voyage dans le Mer du Nord*, 1767-8. Cook's 1st voyage.

tory and certain; a cast obtained with a well "armed" deep-sea lead, when the ship's way is stopped is of itself conclusive. As has been seen above, a vessel striking and passing on would not be conclusive without further corroboration.

Thus the subject that next demands attention is, What is a discoverer to do to establish the reality of his first impressions?—and it is in the discharge of this important duty that the greatest remissness or want of knowledge is often shown. There is also a natural disinclination on the part of the Hydrographic Department to admit shoals on their charts the existence of which is not satisfactorily defined.

At least one such careful cast of the lead should be obtained whenever there is reason to believe the ship is in soundings, from the appearance of the water or a rock or land being reported in sight; or whenever, if the ship is in soundings, the water appears shoaler than there is reason to expect. In the case of a dangerous shoal or rock, or what appears such, it should further be approached cautiously as nearly as prudence will admit, and it is surely not too much to expect that, if the weather be fine, a boat should be sent to make sure of its nature, especially if no bottom can be got from the ship. Any specimen of the bottom obtained should be carefully preserved. Reports of soundings having been obtained are open to grave question, unless the rate at which the ship was going through the water at the time is quite clearly given; and also unless it is known that the cast was taken with the deep-sea lead, and was not a mere hurried cast of the hand-lead. Soundings should be continued as long as on the shoal, and until the normal depth of water is again met with. The fact cannot be doubted that when a seaman is sent to the hand-lead on appearance of shoal water, he is too liable to imagine, firstly, that he is expected to get bottom, then that he ought to, and lastly, that he actually does get bottom. In all cases the lead should be used as recommended above, and no doubt should be suffered to exist of the correctness of the soundings. The sight only of supposed land is seldom conclusive, even if people could be seen on it. Indeed, nearer examination would be called for in this case, if it were possible; they might be a party in distress on an ice island.

From the time at which any such discovery is made a most careful log of the vessel's course and proceedings, with the times of each sounding, and of alteration of course, with everything that could affect the ship's dead reckoning, should be kept up to the next observations for latitude and longitude. We here pass to the subject of determining the position and extent of the danger.

The time, by ship's clock, of the discovery and that of leaving the shoal water is important, as in such circumstances it is natural to estimate the duration of the period of anxiety as much in excess of what it really was. Bearings of land, if in sight, or angles should be taken as soon as possible after the discovery. I recollect the first order of a surveyor of my acquaintance, whose ship got ashore, was, "Quartermaster, hand up my sextant." Without going to this extent of enthusiasm on the subject, early observations are all important.

Where additional observations are made, it is not necessary that the officers of the ship should make all the calculations: this may relieve anxiety on the score of the extra trouble to be caused by a proper report; but what is indispensable is, that a systematic record of the occurrence should be kept and sent in. A few plain directions shall now be given: and it is not intended in this article to trench on the province of the surveyor, but merely to act as a guide to the average navigator, and to confine ourselves to the essentials. They are here collected from various sources, and a few hints only are original; and in the first place as to how observations are to be recorded.

In all observations it must be clearly stated how the latitude and longitude were determined; whether astronomically or by crossbearings or angles, or by account only; and the original observations should be sent in all cases, as well as the calculated results, if the computations are made, and a copy of all the calculations made should be attached.

With reference to the instruments, the maker's name, and number of each chronometer, if more than one, and the size and maker's name of each sextant, quadrant, or compass used should be given. If compass bearings are used, the uncorrected compass bearing should be given as read off, and the correction for local deviation given in a separate column, with a note of the time and manner it was last ascertained: the direction of the ship's head at the moment should be also noted, the corrected reading being given separately.

Observations with sextant are to be entered in the observation book exactly as taken, the reading of the sextant is to be written down uncorrected, and in a column by the side of this should be written the correction for index error with a statement whether it is to be added to or subtracted from the reading of the sextant. A reference should be added to the observations by which the index error was determined. To avoid any possibility of error another column should contain the corrected angle. It is preferable that the index error should be noticed at the time of the observation, and the measures by which the index error was ascertained should be written down exactly in the manner in which they were made, so that any other person can calculate for himself the value of the index error.

For altitudes, the height of the eye, the depression of the horizon, and the altitude corrected for dip should also be stated. The time of making every observation should be entered exactly as it is read from the chronometer, or hackwatch, and the error of the watch on Greenwich time should be placed near this, followed by the corrected time. In some convenient place must be given all the observations by which the errors of the chronometers were determined, giving place, date, and whether rated before or after they were put on board. If a hackwatch be used, the comparison of the watch with each chronometer must be given.

A copy of the ship's log from the time of the last astronomical observation (or departure, if land was in sight) preceding the event, to the noon following, or to the next observations for latitude and longitude, is required. It should contain the uncorrected courses, local deviation, and corrected courses, and should give the ship-time of every occurrence,

with amount of *correction* of dial at the noon following, and nothing should be wanting to render the "day's work" as complete as possible. It should be stated how the ship's speed was measured, whether by common log, patent log, or estimate from revolutions of engine, &c. The amount of error of lead-line, which should be measured at the time (after use), should be given. If from any cause any entries are subsequently added, or not made at the time, they should be distinguished and the date of entry given.

In giving the ship's time for the occurrence, it should be stated whether civil, or astronomical, or nautical log-book time, the former being preferable.

With regard to the hydrographical observations that should be made, it is beyond the limits of an article like this to indicate the method of making even a running survey; a special book should be consulted, and for the unprofessional mariner, the unpretending little work of Captain Hull, R.N., called *Practical Marine Surveying*, which costs a mere trifle, may be recommended as combining every requirement, and it is written in plain sailors' English, for the use of persons unacquainted with surveying. However, it is seldom a survey of even a rude description can be hoped for, but while in sight, bearings, or better still, sextant angles, should be taken at intervals, of the most remarkable objects, noting the exact time of each set of bearings, also altitudes of peaks above the horizon, to be taken both "on" and "off" the sextant. If any sketches of the land can be made they will be valuable.

The latitude and longitude of the ship should be determined as carefully as possible, as soon after the discovery as an opportunity offers, by the usual methods. Observations for time should be made both A.M. and P.M., or a star near sunrise or sunset, when the horizon is well defined, gives good results. On making the first known land after the occurrence, the chronometer should be checked by observations, if possible, on shore; if not, by taking an observation for time when in the meridian of the land.

The details of the last astronomical observations, or departure by bearings of land, previous to the discovery, should also be given.

The longitude from Greenwich, or meridional difference from last place where the rates were observed, should be given separately, and if the chronometers have been rated by the officer's own observations, the longitude adopted for the rating station must be given, and the exact place of observation described clearly. Raper observes "It will, indeed, be evident on a moment's reflection, that the longitude described merely, as is too often the case, as 'longitude by chronometer,' without reference to some fixed point, is utterly valueless. Again, when such fixed point is mentioned it is no less necessary to note the longitude adopted; for instance, 'Longitude by chronometer from Callao' is little better than no allusion to place at all, as Callao appears in the tables in different longitudes from 77° 4′ to 77° 14′."

As the observer has better opportunity of forming an opinion on the relative excellence of his chronometers, he should give an estimated mean, in which greater weight would be attached to the result as given by the better watches, in addition to the arithmetical mean of the meridional differences.

If the lunar observation is available, it would be important to take at least two sets of distances, one on each side of the moon if possible.

If known land is in sight, no astronomical observations can supersede the necessity of bearings of the land, or better still, a "round" of sextant angles. It is to be regretted that the simple art of taking horizontal angles with a reflecting instrument is so little practised. If the peaks or objects on shore cannot be identified with any delineated on the chart, it is no reason they should not be observed, and a description, or better still a rough sketch, should be appended. Bearings of extremes of land are very valuable when not so distant that the beach is "down" or below the horizon. If angles are taken, a good compass bearing of *one* object should be also given, or if a true bearing be observed, it will add greatly to the accuracy of the result. A good bearing of two objects when in a line, or "in one," is always of great value, especially if a sketch be given showing their appearance. No information can be too trivial to be recorded, and all remarks should be written down *at the time*, nothing being trusted to memory. Notes might be dictated from time to time to the officer who should be at once detailed to note time, lead, &c.

Much more might be said on this subject, but a reference to Raper's book, 7th edition, pp. 281, 333, 337 and 359, will furnish most of the necessary details. The Admiralty Manual contains brief instructions for a running survey, but presupposes, perhaps, more knowledge of the subject than is possessed by the average seaman. Captain Hull's little book is probably the best work available for a person with no previous knowledge.

The report of the discovery should in all cases be made to the Hydrographer of the Admiralty direct, or to Lloyds, or, in India, to the Superintendent of Marine Surveys at Calcutta; and to avoid such reports being withheld from financial considerations, it would be well if it were clearly understood that no expense need be incurred for postage, if the letter be addressed "on Her Majesty's Service." A few blank forms with a brief abstract of instructions printed on the face of each might perhaps be advantageously distributed to every ship proceeding on a voyage beyond our own coasts; or it might be the best plan to have a few such forms bound up with every official log, which might be detached and sent in as occasion required. If an attempt at a survey or plan be made, however rough, the original should be retained on board, and a tracing sent in with the report.

The question bids fair to assume such dimensions as to call for a special branch of the Hydrographic Department to receive and deal with such reports.

This paper has already extended to such a length, that the last subject, viz., that of errors in existing charts, must be dealt with somewhat briefly.

There are still many parts of the world of which the charts are incorrect or incomplete, as is often obvious on mere inspection of the sheet. Emendations of such portions, or reports of unexplored dangers in such localities, are always valuable. The date of the chart will often furnish a guide as to its completeness, and unsurveyed, or only partially explored parts are represented in all new charts by a distinct style. But if the coast be well surveyed, reports of new shoals

will require the most exact and circumstantial data to be given before they can be entertained; and the mariner, especially if not a practised surveyor, should in the first place, put the fact beyond a doubt, that the error may not be in his own observations or reckoning. Raper gives careful instructions for estimating the "degree of dependence" of ordinary observations.

When a ship gets into difficulty or danger, the general, and indeed very natural practice, seems to be at once to lay the blame on the chart, which is forthwith reported, as "out" in latitude and longitude, or "that the reef was not laid down on the chart," &c. Many instances of such reports must occur to every surveyor, and in some cases at least have been made to screen neglect or reckless navigation on the part of the master. The writer remembers, in 1860, passing the wreck of a merchant-ship on the Katiwar coast, lying not above a cable's length from high-water mark, on a coast as free from danger as any in the world, the master of which, on arrival in Bombay, had reported the vessel lost on a reef of rocks not laid down on the chart.

But it is needless to multiply instances of the sort: and if these remarks induce seamen to be more careful in condemning charts without sufficient warrant, and to make every possible verification of the supposed error, and lastly to include in their report all their observations at full length, they will have attained their end.

It is not imagined that this paper contains anything new or startling; it is written in plain words, in the hope of attracting the attention of seamen, and of directing the attention of the public to what the author considers a great and growing evil. The difference in amount of trouble to the discoverer between a proper, honest report, and a defective and useless one, is so slight, and the difference in value to the maritime world so great, that it seems to call for some decisive action on the part of the powers that be, and if, as a preliminary, the Admiralty were to publish detailed, plain instructions, it would be a valuable step in the right direction.

Arthur W. Stiffe.

SIR HENRY KELLETT, K.C.B.

A little more than two years ago we had to record the death of Sir Robert M'Clure,* and now another of our Arctic worthies has passed from among us—the distinguished officer who rescued M'Clure and his gallant crew, and under whom the Commander of the expedition that is about to sail acquired his Arctic experience.

Henry Kellett entered the Navy in 1822, and was three years in the 'Ringdove,' on the West Indian station. After a short service in the 'Gloucester' (74), he went to the Coast of Africa in the 'Eden' (Captain W. F. Owen), in 1827. During part of his service there he had the command of the 'Cornelia' tender. The great sickness and mortality among the officers, having caused a number of vacancies, he was promoted to the rank of lieutenant in 1828. In the latter part of the commission he performed the duty of First Lieutenant. Returning to England in 1831, he joined the 'Ætna' (Captain Belcher), and proceeded again to the Coast of Africa on surveying duty. In the sickly season the 'Ætna' was sent to the Douro—the town of Oporto being then besieged by Don Miguel. He here saw much hard service in the Bar boat while maintaining the communication with the fleet outside. In 1833 he went again to the Coast of Africa as First Lieutenant in the 'Ætna,' under Captain Skyring, and was present when that officer was treacherously murdered by the natives; he then succeeded Lieutenant Arlet in the command of the 'Raven.' In 1835 he was appointed to the command of the 'Starling,' tender to the 'Sulphur' (Captain Beechey), for the survey of the Pacific. On the arrival of the ships at Valparaiso, the state of Captain Beechey's health compelled him to return to England, and Kellett received an acting order as commander of the 'Sulphur,' which he held until February 1837, during which time the coast was surveyed from the river Guayaquil to the Bay of Choko.

When Captain Belcher arrived from England at Panama and took command, Lieutenant Kellett returned to the 'Starling.' Proceeding along the coast to the northward, surveying different harbours *en route*, the two vessels crossed over to the Sandwich Islands, and then proceeded north to the 60th degree of north latitude, to fix the position of Mount St. Elias. On the way south Sitka and Vancouver's Island were visited, and the coast of Mexico; the two vessels reaching Callao on June the 3rd. Returning to the north the survey of the coast between Panama and Mazatlan was continued, and the Sandwich Islands and North-West Coast of America revisited. On December 21st, 1839, the ships proceeded on their homeward voyage round the world, touching at the Marquesas and Bow Island, where they attempted to bore through the coral, but only reached 45 feet when the auger broke. The vessels then touched at Tahiti, Fiji, and New Ireland, and visited the Moluccas, arriving at Singapore on the 16th of October, where orders were found for them to proceed immediately to China. In passing up the Salawan Passage the 'Starling' was struck by lightning, having her foremast, topmast, and top-gallant-mast shattered, and three of the crew wounded by the electric fluid. Arriving in the Canton River on December 14th, 1840, the two vessels proceeded at once to the Bogue, which was reached in time for them to take part in the capture of Chuenpu and Tycocktow, and the capture of the Bogue Forts and First Bar Barricade. By dint of much sounding, a passage was found for vessels of 14 feet draught, to the southward of Danes Island, and the ships being safely piloted, Canton was reached by the Macao Creek instead of Whampoa. This made it practicable to attack the city from two sides, which resulted in a capitulation being signed by the Chinese on May 27th, 1840.

In these operations Lieutenant Kellett is thus officially mentioned in the despatches:—

January 7th.—"High commendation of Lieutenant Kellett for conducting the 'Queen' steamer into action at the capture of Chuenpu and Tycocktow."

March 18th.—Capture of Canton.—"To Lieutenants Kellett and Collinson, and Mr. Brown, master of the 'Calliope,' every consideration is due for having made themselves particularly useful in sounding, and afterwards conducting several men-of-war safely to an anchorage off the city of Canton."

Lieutenant Kellett for these services received his promotion to the rank of commander on May 6th, but owing to constant exposure and fatigue he was laid up with rheumatic fever for two months. On the arrival of Sir W. Parker and Sir H. Pottinger, the fleet proceeded to the northward, leaving the 'Sulphur' and 'Starling' at Hongkong; but Sir William, feeling the value that another surveying vessel would be to the expedition, ordered the 'Starling' to join the fleet at Chusan. Not being able to make way against the monsoon, she was obliged to remain at Amoy until the spring of 1842, and during this detention Kellett made an elaborate survey of that harbour. Joining the fleet in April 1842 he took

* See *Ocean Highways*, for December 1873, p. 353.

part in the capture of Chapoo, placing buoys for the position of the fleet, and accompanying Sir H. Gough from the landing-place of the troops to the escalade of the city.

When it was decided (mainly in consequence of his advice) to make the next impression on China, by way of the Yangtse-kiang, the piloting of the fleet was entrusted to Commander Kellett by Sir W. Parker. The fleet was thus brought into the river in safety, a feat which is thus spoken of by Sir W. Parker in his despatches. 'The intricate parts of the Channel delineated in Captain Bethune's chart having been previously buoyed by the surveying officers, the fleet succeeded in reaching the limit of that officer's valuable researches within 2½ days, and every subsequent difficulty has been most commendably overcome by the unremitting exertions of Commanders Kellett and Collinson, assisted by other surveying officers and the masters of the fleet." On reaching the entrance of Woosung it was necessary to ascertain whether there was sufficient depth of water for the fleet opposite the batteries. This difficult task was undertaken by Kellett after dark, and a buoy placed within half a mile of the principal battery. The Chinese army which had been brought down to the beach to oppose the landing, gave a general shout which was heard by the fleet outside, and led to the impression that the surveying officers had been captured. Fortunately no Chinese fired; otherwise, the destruction of every one in the boats was inevitable, but by letting them drift quietly out the fleet was reached and the forts captured without loss, and the ships were carried safely into their positions on the following morning.

He next proceeded with the fleet to Shanghai, and assisted in the capture of that place. Sir W. Parker, in his despatch on this occasion, fully recognised the value of these services:—"Commander Kellett's zeal on this service and every other on which he is engaged exceeds all praise. From here the river was unknown, but by aid of the small steamers and the staff which the Admiral placed under his command, every difficulty in navigation was overcome and the fleet safely conducted through an intricate navigation to Chinkiangfoo." After the capture of this city the surveying vessels were ordered to examine the river, and having found a navigable channel to Nankin, the fleet was safely conducted to an anchorage off that city.

Sir Henry Pottinger, in his despatch to the Earl of Aberdeen, thus expresses himself:—"Before I proceed to the chief object of this despatch I beg to premise that although I doubt not in the slightest degree that Vice-Admiral Sir W. Parker will bring to the particular notice of the Lords of the Admiralty the merits of all officers serving under his orders; yet, feeling as I do, from immediate personal observation, that much of the successful result of the expedition has sprung from the extraordinary zeal and unremitting labours of the survey department, I am sure your Lordship will not deem me to be going beyond my province if I mention as deserving, in my opinion, of the special consideration and favour of Her Majesty's Government, the names of Commanders Kellett and Collinson and the officers employed with them on that most important branch of the public service; and I think it only right to add that I venture this recommendation entirely unknown to the valuable officers who are the subject of it."

During the time that the Treaty was being arranged, the regular survey of the river was commenced, and after the fleet had been safely piloted to sea, it was completed before the surveying vessels left the river.

It being of great importance now that ports in China were opened to British commence, that the access to them and the coast between the Yangtse-kiang and Amoy should be laid down correctly, the 'Starling' and 'Plover' were detached for this service, and at Hongkong the charts were at once reduced, and with the sanction of the Commander-in-Chief, were placed in the hands of the Chinese chart copiers, so that access was given to information which was necessary to render the navigation of the China Sea safe. On his arrival at Amoy, Commander Kellett had the satisfaction to learn that he had been promoted to the rank of Captain and made a Companion of the Bath. The Admiralty, in further recognition of his services, ordered the 'Starling' to be rated as a ship which enabled him to retain his rank and to serve his time. The Emperor of China having ratified the Treaty, Captain Kellett was selected by Sir W. Parker to carry his despatches to England.

After a sojourn of some months at home Captain Kellett was selected by the Admiralty to commission the 'Herald,' and, in company with the 'Pandora,' to proceed to the Pacific to continue the survey of that ocean. Taking up the survey at the Bay of Choko, the coast-line was laid down to the Bay of Panama. On the approach of the rainy season the vessels proceeded to Vancouver's Island, and commenced the survey of the Straits of Juan de Fuca.

In the latter part of the year 1846 the vessels proceeded to the southward, and while surveying in the neighbourhood of Acapulco Captain Kellett and four officers were taken prisoners by the Mexicans, under the impression that they were officers belonging to the United States, then at war with Mexico. After a detention of eight days, during part of which time they were in serious danger of losing their lives, they were liberated. The 'Herald' then returned to Panama and Callao to recruit; and the survey of the coast of Ecuador was resumed in August. In April 1848, on their return to Panama, orders were received for the 'Herald' to proceed to Behring Straits to assist in the search for Sir J. Franklin. Visiting the Sandwich Islands and Petropaulowski, the 'Herald' reached Kotzebue Sound on September the 14th, whence, after waiting for the 'Plover' until September 29th, when the setting in of winter warned them to depart, they returned south. In 1849 the 'Herald' again proceeded to the north, and reached Kotzebue Sound on July 15th, where she found the 'Plover' just arrived. Proceeding immediately to the north, Lieut. Pullen was despatched from Wainwright Inlet in two boats to search the north coast as far as the Mackenzie River. The 'Herald' proceeding to the westward discovered an extensive range of mountains in the north-west, being the land which the natives had reported to Baron Wrangell as having often been seen from Cape Jakan. After landing upon an island and taking possession, the 'Herald' returned to the south. In 1850 Kotzebue Sound was reached on the 6th of July. Proceeding to the north, the 'Investigator' was fallen in with on the 31st, and the 'Herald' returned to the southward. Visiting the Sandwich Islands, Hongkong, the Keeling Islands, and the Cape of Good Hope, the 'Herald' reached England on June 6th, 1851.

On the return of Captains Austen and Ommanney from the Arctic Regions in 1851, the Government determined to send the 'Assistance' and 'Resolute' back to continue the search. Sir E. Belcher was appointed to command the expedition, and Captain Kellett to the 'Resolute,' with the 'Intrepid,' under the command of M'Clintock, as tender. The squadron left the Nore on April 21st, 1852, and after touching at the Whale Fish Islands, Godhaven, Lievely, and Upernavik, the North Water was reached on July 28th, and Beechey Island on August 11th. Leaving Beechey Island on the 15th, the two vessels were stopped by the ice in the neighbourhood of Dealy Island, where they passed the winter. Lieutenant Mecham was despatched to Winter Harbour, and there found Captain M'Clure's despatches. In the spring parties were despatched to search the shores of the Parry Group, and Lieutenant Pim was sent across the Straits to Banks' Land, where he found the 'Investigator' still detained in Mercy Bay. Captain M'Clure immediately came over to the 'Resolute,' and as the escape of the 'Investigator' was hopeless Captain Kellett, after due consideration, ordered the

vessel to be abandoned. After a vain attempt to reach Beechey Island, the two ships were compelled to pass the winter in the pack. In the spring Lieutenant Mecham was despatched to the Prince of Wales Straits, where he obtained information concerning the 'Enterprise'; so Captain Kellett had the satisfaction not only of rescuing the crew of the 'Investigator' from their perilous position, but of bringing to England the news of the safety of the 'Enterprise.' In April orders were received to abandon the vessels, which was done on May 15th, and the retreating officers and crews reached Beechey Island on the 28th. Captain Kellett returned to England in the 'Phœnix.' At the conclusion of the court-martial which was held in consequence of the abandonment of the ships, the President observed that he experienced much satisfaction in returning Captain Kellett his sword, which he had worn with so much credit, satisfaction and advantage to his country.

In 1854 Kellett received the appointment of Commodore in the West Indies, where, owing to the complications arising from the slave trade to Cuba, and the wars in Mexico and Central America, difficult diplomatic questions arose which called for immediate action, and such was the confidence which Her Majesty's Government felt in the Commodore's ability and discretion in dealing with these matters, that they extended his period of service from three to five years. This, however, told upon his constitution, and he was laid low by a severe attack of yellow fever. On leaving the station, the merchants of Kingstown presented him with a service of plate, as an acknowledgment of their respect for him, and in recognition of the value of his services.

Obtaining his flag-rank in 1862, his services were acknowledged in 1864, by the appointment to the post of Admiral Superintendent of Malta Dockyard. While there the preliminary works of the new docks and extension of the dockyard were commenced, and many there are who now remember the admirable way in which he maintained that hospitality for which his country is so justly celebrated.

In 1869 he was appointed to the command of the fleet in China, and just before leaving England, while on a visit to a friend, was thrown from a dog-cart, and suffered such injury that, for a time, it was thought he would not be able to take up his appointment. Indeed, his relations were most anxious that he should not do so; but directly he regained his strength the desire for active service was so strong that he would brook no opposition. The anxieties of that command, comprising as it does a larger number of vessels than any other, told upon his constitution, and while awaiting the arrival of his successor, he had the misfortune to be struck by a *coup de soleil*. Returning to England in impaired health, it was hoped that quiet and rest would restore him, and he retired to his country seat, Clanacody. These hopes were, however, doomed to be disappointed, and last year he was seized with a paralytic stroke, from which he only partially recovered, and at length gradually sunk to his rest, without pain, on the evening of the 1st of March 1875.

During an active service of forty-one years abroad he was for six years on the coast of Africa, eight in the West Indies, five on the China station, two in the Arctic Regions, and ten on the Pacific Station. He was a Fellow of the Geographical Society, and a Member of the Geographical Club.

Hearty, joyous, open in his manner, he gave pleasure wherever he went. Fond of his profession, a first-rate sailor, a good surveyor, he delighted in hard work, and when work was done, was foremost in play. He has left behind him a memory which will be cherished by all who had the pleasure to know him, and many there are who sorrow to think they shall see him no more.

Reviews.

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ENGLAND AND RUSSIA IN THE EAST.*

This important work contains the most recent as well as the earlier results of Sir Henry Rawlinson's experience, and of his study of Persian and Central Asian politics and geography. It thus enables all Englishmen, who take an interest in public affairs, to acquire a knowledge of a difficult subject which affects the welfare of this country very closely, from the very highest authority.

The first chapter is a reprint of an article in the *Calcutta Review* on our political relations with Persia down to the accession of Muhammad Shah in 1848, and the second chapter continues the narrative to the present day. The record commences with Lord Wellesley's attempts to embroil Persia in a war with Afghanistán, in order to prevent Zaman Shah from invading the Panjáb; and, during the seventy-seven years that have elapsed, our diplomatic intercourse with Persia has been guided by no settled or continuous policy. This must strike every reader. The history commences with an unseemly clashing of two envoys, with different instructions and opposite views; and the succeeding events are but a continuation of this beginning. At one time we make a defensive and offensive alliance coupled with a promised subsidy, at another we evade the treaty and refuse payment of part of the subsidy; at one period we attempt to create a Persian army disciplined by English officers, at another we treat Persian affairs with indifference and neglect; sometimes we intrigue with Persia to invade Afghanistán, at others the Afghans are urged to threaten Persia; while the conduct of negotiations is sometimes placed under the Indian authorities, in order that they may be conducted from an Eastern point of view, while at others all the appointments are made by the Foreign Office, and filled by diplomatists whose knowledge is confined to the politics of Europe. The inevitable consequence of this absence of continuity in our policy is that Persia, instead of being, as she might easily have been made, a firm and steady ally and a bulwark to our Indian possessions, is a mere Russian outwork.

A second reflection that the perusal of these essays will inevitably give rise to is, that serious injury is done to the interests of England by the extraordinary want of geographical knowledge among the statesmen and some of the diplomatists who have conducted negotiations relating to these countries. An inexcusable ignorance of political geography was betrayed in the Morier and Ellis Treaty of 1814; and, not to quote other instances, the recent negotiations with Russia respecting the northern boundary of Afghanistán furnish another striking example of the danger of such ignorance. Lord Clarendon gave a map to Prince Gortschakoff as correct, and upon which negotiations might be based, that made the

* *England and Russia in the East.* A series of papers on the Political and Geographical condition of Central Asia. By Major-General Sir Henry Rawlinson, K.C.B., F.R.S., President of the Royal Geographical Society. Formerly Envoy and Minister at the Court of Persia. With map. Murray, 1875.

Indian Caucasus the boundary of Afghan territory; and when Russia, on the strength of this map, made a proposal which would have given her the right to absorb all Afghan Turkistan south of the Oxus, our Foreign Office was not aware of the extravagance of the proposal. Fortunately the India Office had the advantage of the advice of statesmen with profound geographical knowledge; and a ruinous concession was prevented.

Certainly some of the dangers to which our interests in the East have been exposed, during the last half-century, have been caused by an absence of continuity in our policy, and by ignorance of political and physical geography on the part of English officials.

To geographers the four last chapters of Sir Henry Rawlinson's work, on the geography and politics of Central Asia, are the most valuable. Two, comprising the third and fourth chapters, are reprinted from the *Quarterly Review*, the fifth is a state paper of great importance which changed the "masterly inaction" policy of Lord Lawrence to one of wise and friendly interest in Afghan affairs, and the last continues the narrative of Central Asian political events down to the present day.

In the first article from the *Quarterly Review* Sir Henry describes the gradual advance of the Russians up the valley of the Jaxartes; and in the second he passes in review the labours of Russian and English travellers in Central Asia, as well as the meritorious reports of natives of India who have been employed as envoys or as surveyors. The information thus brought together can be found in no other published work in a connected form, and it is here arranged with such literary skill and complete mastery of the subject that the work will for many years be the chief authority on Central Asian questions.

The Russian encroachments have rendered it necessary to define the northern limit of Afghanistán as that of the principalities and states which paid allegiance to Dost Muhammad Khan at the time of his death. The boundary may be described as the line of the Oxus from Khoja Sáleh to its source, following the main stream, and including Badakshan and Wakhán. It was generally assumed that the stream issuing from Lake Victoria, being the Oxus source discovered by Lieutenant Wood, was the line indicated. But the discoveries of officers belonging to Sir Douglas Forsyth's Mission, on the Pamír table-land, show that the main stream of the Oxus is a river which rises in the little Pamír Lake, running in the first instance to the east until it joins the Aktash, then turning to the north-west and circling round the elevated plateau of the Great Pamír, where it is joined by an effluent from Lake Karakul, and from whence, under the name of Mughábi, it flows down the great Shignán Valley, and unites with the southern branch of the Oxus at Wamír on the confines of Roskan. This river is well known to form the northern boundary of Wakhán, and from its size, as well as its length, has every right to be regarded as the main stream of the Oxus. Sir Henry Rawlinson therefore expresses a hope that in all future maps it will be adopted as the definite frontier of Afghanistán.

As Russia has now conceded the main question of the Afghan right to Badakshán and Wakhán, she is bound to accept the established frontiers of these districts as the line of demarcation which limits her own dependencies of Kokand and Bokhárá to the south. But the intervening Pamír Steppe to the northward will long form an effective barrier to invasion, and so far as Indian interests are concerned, the encroachments of the Russians on the Turkman territory east of the Caspian, in the direction of Merv, are far more important, and require very close and vigilant watching. The occupation of Merv, which is evidently intended, will place Herat, the key of India, in danger, and will be a direct menace to this country.

On this part of the subject Sir Henry Rawlinson gives no uncertain sound. His advice is bold, but at the same time prudent and thoroughly practical. In the sixth chapter the recent aggressions of the Russians in this direction, from the occupation of Krasnovodsk on the east coast of the Caspian in November 1869, are fully described, as well as the physical aspect of the country between the Caspian and the Murghab Valley, in which Merv is situated. The object of the attack on Khiva was declared by Count Schouvaloff, in January 1873, to be to recover prisoners, and it was solemnly declared that the conditions imposed on that State would be such as not in any way to lead to prolonged occupation. The truth was that the expedition was intended to destroy the independence of Khiva, and make it a Russian dependency, and when this became known, "it was felt," as Sir Henry says, "that we had been grievously deceived, that public faith had been broken, and that an Emperor's word had been weighed in the balance and found wanting." In future it will be a mere waste of time to ask for explanations, and there is nothing left for English statesmen to do but to let their intentions, in certain contingencies, be clearly understood, and to watch the course of events with suspicious vigilance. Our Government has already pointed out, in firm but courteous language, that a Russian expedition against Merv would very possibly lead to our intervention in support of the integrity of Afghán territory.

Sir Henry Rawlinson clearly shows that if Merv eventually becomes one of the bulwarks of the Russian position towards India, the danger of collision with England will assume a tangible form. He adds:—

> "There is one point, indeed, the pivot of the whole Eastern Question, which must never be lost sight of—*We cannot afford to expose Herat to the risk of being taken by a Russian coup de main.* If a Russian force is sufficiently near to threaten the safety of the keys of India, we must also have a British force sufficiently near to protect it. All other questions relating to the Russian position in Central Asia are, as far as British interests are concerned, of much inferior importance to the Turkman expedition and its results. . . . . The present expedition against the Turkmans is merely one of a series of movements that will almost infallibly lead the Russians to Merv."

Sir Henry then points out that the facility of taking Herat by a *coup de main* from Merv is so patent, while the consequences of that movement to British India might be so fatal, that it becomes a matter for consideration whether the Russian occupation of the one city should not be immediately followed by the British occupation of the other. There is little reason to doubt that the Amír of Kabul would acquiesce in this occupation, as an auxiliary measure of Afghan defence, and, in that case, the march to Herat, by Quetta and Kandahar, would be a mere military promenade. The garrison of Herat would be 5000, of Kandahar 3000, and of Quetta 1000 men, the greater part being, of course, Europeans. The neces-

sity for this measure is shown in the closing paragraphs of Sir Henry's work. Russia, by advancing on Merv, would evidently mean mischief. She would never embark on an enterprise of so perilous a nature for mere purposes of trade or police. The object would necessarily point to Herat, which would lie at the mercy of a European power holding Merv, and from whence India would be seriously threatened.

"If Russia," he concludes, "remained encamped on the Caspian, we should hold aloof from Herát; but, if she deliberately threw down the gauntlet, she must expect it to be taken up. We could not, as the guardians of the interests of India, permit her, on the pretext of curbing the Turkmans, or establishing a trade-route through Asia, to take up a position unopposed on the Murghâb, which would compromise the safety of Herát. That city is both strategically and politically an indispensable bulwark of India, and we cannot and will not allow its future fate to be at the disposition of a foreign power."

The work is illustrated by a map of Central Asia, which, apart from its intrinsic excellence, will have a special interest for geographers. It is the last work done by Mr. John Arrowsmith, and he was busily engaged upon it during the last week before his death.* It has been made more complete by additions from recent English and Russian surveys, especially as regards the mouth of the Oxus and the rivers on the Pamir Steppe, and is, as Sir Henry Rawlinson says, the most accurate delineation, on a small scale, of the vast regions of Central Asia that is now to be obtained. The coloured political boundaries are inserted on Sir Henry's own authority, and show the line of the Shignan River, which forms the proper limit of Wakhán, as well as the correct Persian boundary along the Kuren Dagh, from near Kizil Arvat to near Sarakhs.

GUMS AND RESINS OF INDIA.†

THE treatise before us professes to be a digest of information collected from numerous and scattered sources rather than a work of original research, but monographs of this kind are most useful as a means of obtaining an idea of the great resources of India.

An elaborate and succinct classification and history is given of no less than 200 gums, resins, and oleo-resins, which are more or less Indian products, with a bibliography of each species. The materials upon which this report is based consist of a reference collection, derived from various sources, not confined to India, and, in most instances, well authenticated, and therefore useful as collateral evidence. The chief source of material was the Museum Collection, which includes specimens sent from India to the Exhibition of 1862, and all European exhibitions since that period, and from samples sent over from time to time for valuation and report.

Amongst the substances to which attention is more particularly directed, as requiring futher information, are:—

1. The curious astringent Mochurrus.
2. The different kinds of Assafœtida, and the plants yielding them.
3. The peculiar gum-resin called Sarcocolla.
4. A tree yielding a peculiar kind of Myrrh, 40 miles eastward of Aden.
5. The source of Black Resins from Burma with an Elemi odour, called Pwainyet, which name is also applied to other kinds of resin.

This report also indicates that a whitish resin from Burma, the produce of *Hopea odorata* and *micrantha*, is likely to meet with a ready sale here.

The reason why the wood-oils, gums, &c., have not as yet found a good market are explained. New, unknown, and untried substances never obtain a full valuation until their qualities have been thoroughly tested. When some special application has been discovered, then only is the true value of the product known, and, until a demand has been created by practical demonstration of its utility, such a substance cannot obtain a remunerative price. It is not so much by valuation and report as by a series of well-conducted experiments that the true value of an unknown substance can be determined. However valuable, intrinsically, an article of raw produce may be, it will not at once, nor for some time, attain a definite rating commensurate with its value. This has been observed also in the case of the East Indian chinchona barks, &c.

It is suggested that the wood-oils are in their crude state partial solvents of caoutchoüc: paper or cotton cloth is rendered waterproof by applying this oleo-resin, the only drawback being its slow drying powers.

Liquid kino is mentioned as one of the substances recently sent for report. Experiments with this astringent substance, mixed with a solution of sulphate of iron, proves that it can be substituted for galls in making ink.

The whole report is most interesting and instructive, and proves how much excellent work is being done by the scientific officers of the India Museum. Dr. Cooke is well known by his numerous works and contributions to botanical and microscopic science.

The appendix contains an exhaustive description of the trees producing frankincense, by Dr. Birdwood, who has studied this obscure subject with diligent research.

THE HAWAIIAN ARCHIPELAGO; SIX MONTHS AMONG THE PALM GROVES, CORAL REEFS AND VOLCANOES OF THE SANDWICH ISLANDS. By *Isabella L. Bird.* (Murray) 1875.

WE have here presented to us the recorded experiences of a lady who visited this distant cluster of islands in search of health, and remained there upwards of six months. During this period she wrote a series of letters, which, with a supplementary chapter on the constitution, trade, social statistics and prospects of the Sandwich Isles, are now before us, in the shape of a most readable work. The scenery of these islands affords excellent scope for the pen of the authoress, as does also the great volcano of Hale-Mau-Mau, the aspect of the crater of which must be very imposing. It forms an irregularly-shaped lake, about 500 feet wide at its narrowest part, and half a mile at its broadest, full of fiery waves, jets and fountains, and perpetually in motion. At one time it was known to sink 400 feet, and at another time

* See *Ocean Highways* for June 1873, p. 123.

† *A Report on the Gums, Resins, Oleo-Resins, and Resinous Products in the India Museum, or produced in India.* By Dr. M. C. Cooke. Prepared under the direction of the Reporter on the Products of India. Pp. 152, plates 4.

to overflow its banks, The volcano is the loftiest active one in the world, being nearly 14,000 feet high, and its crater is apparently quite in keeping with the dignity of the volcano, for we are informed it is more like the bottomless pit than anything else. In a region remarkable for volcanic activity, subterranean disturbances are matters of course, but the great earthquake of 1868, with its attendant horrors of rivers of fire from 200 to 800 feet wide, fountains of lava casting up rocks weighing many tons to a height of from 500 to 1000 feet, and a succession of shocks amounting to about 2000 in a fortnight, is a picture fairly to appal one. The authoress's description of the whole scene as related to her will repay perusal. The native population of Hawaii is decreasing; a matter of regret, as they have shown special tastes for European civilization. Sugar is the reigning interest on the islands, but it labours under the disadvantages of a paucity of labour and heavy import duties at San Francisco. As remedies, some talk of annexation, and some of ceding a certain lagoon as a naval station to the United States, and as a "consideration" for a reciprocity treaty, but all surrender of territory is strongly opposed by the Hawaiians. The islands are productive, but the want of a market and of labour, as well as various forms of blight, militate seriously against any development of their resources.

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VENTS ET COURANTS, ROUTES GÉNÉRALES; EXTRAIT DES SAILING DIRECTIONS DE MAURY ET DES TRAVAUX LES PLUS RÉCENTS. Par *M. Charles Ploix* et *M. Cuspari.* Paris: Imprimerie Nationale, 1874.

THIS work, published by the French Government, is a part of the Météorologie Nautique, and, as stated in the title page, is chiefly derived from the admirable works of the late Captain Maury. But admirable as were the works of that talented American officer, as the foundation of a system, it must be remembered that great advances have been made in meteorological and physical science since his book appeared, and this work scarcely brings up the information to the present day, as we may instance (although not bearing on meteorology) that, although the soundings obtained by the 'Challenger' in the North Atlantic are given in Plate III., the instruments and means by which those observations were obtained are not given; all the sounding instruments depicted in Plate II., and described in the second chapter, being obsolete. That the work will be of much use to the French navies there cannot be a doubt, but we do not see in it anything that will add to our own present knowledge.

GREAT TRIGONOMETRICAL SURVEY OF INDIA REPORT.

WE have received, at the moment of going to press, an early copy of the annual report on the operations of the great Trigonometrical Survey of India, and much regret that the want of space, and forward state of publication, renders it impossible to review the work in time for the present number. The report is of unusual interest. It includes accounts of the arrangements made for connecting the triangulation of India with that of Ceylon, and of the completion of the revision of the Great Arc from Cape Comorin to the Himalayas; reports on geographical exploration in Kashgaria, and on the Pamir Steppes, in connection with Sir Douglas Forsyth's mission to the court of the Atalik Ghazi, and on several additions to our geographical knowledge of portions of Great Tibet, and of Nepal, which have been obtained through the agency of native explorers. The detailed narrative reports will, as usual, well repay perusal; those by Lieutenant Gibbs, Major Branfill, and Captain Heaviside, respectively claiming notice for their general as well as scientific interest.

Cartography.

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Johnston's Cabinet Atlas.*

THIS is evidently a posthumous work of the eminent geographer whose name appears on the title page, and who died in July 1871. The author has evidently planned his work with great care; the maps are neatly engraved, though occasionally too much crowded to facilitate reference; and if the information had been brought down to the present date, as would no doubt have been the case had the work been published under the personal superintendence of its originator, we should probably be able to record a success equal to that achieved by many other well-known works by the same author.

Our geographical knowledge increases from day to day, and the cartographer is bound to be constantly on the watch, so that no important discovery achieved by our explorers may remain unrecorded, and that the maps issued by him may represent, as near as possible, the extent of our knowledge at the date of publication.

The very first map in this Atlas, designed to illustrate the physical and commercial geography of the world, fails to meet this requirement. Africa, for instance, is not the almost unbroken highland which it is there represented to be, and amongst the coal-fields of the world those of Southern Russia and China, long known to us, and lately brought prominently into notice by Baron Richthofen's instructive reports, ought to have found a place.

Dr. Johnston evidently meant this to be a Political Atlas, and we are not disposed to quarrel with him for having treated the physical features rather cavalierly. On the contrary, we think it a mistake to combine too many features on so small a scale. Taking then the political boundaries as the principal test of this work, we reluctantly arrive at the conclusion that it falls far short of what we have a right to expect. Due diligence ought to have been taken to render the boundaries distinct, so as to enable the reader to trace readily the territories of the different states, provinces, and extra-European dominions. But if we turn to the map of Europe we find nothing to indicate that Malta, Gibraltar, and Heligoland are British settlements. The map of Austria takes no notice of the abolition of the frontier of the Banat, that of Russia fails to show the Government of Ufa, formed in 1865 out of a portion of Orenburg.

When we leave Europe the errors, both of omission and commission, become still more serious. The map of Asia scarcely enables us to trace the possessions of the European powers, and conveys altogether erroneous notions with reference to the extent of some of the native states. The Turkish boundary is carried right down to the gates of Aden, in spite of the protests of the British Government, and the actual facts of the case. But what the Turks gain in Western Arabia, they lose on the gulf of Persia, for Hassa, though conquered by them in 1858, is still shown as an independent country. The "rectification" of the eastern frontier of Persia remains unnoticed, and the countries on the Upper Oxus are withheld from Afghanistan, which is actually in possession of them. The eastern shore of the Caspian, where the Russians have their important station Krasnovodsk, is included in the independent Turkman country, which is all the more strange as the recent annexation of a portion of Khiva has been recorded.

The maps of Africa are, perhaps, the least satisfactory of the series. The person charged with the revision

* The Cabinet Atlas of the actual Geography of the World, constructed by A. Keith Johnston. 34 maps. London and Edinburgh, 1874. 21s.

of them, with a view to their publication, appears to be in a most deplorable state of bewilderment with respect to the Nile sources. There are "sources of the Nile" in latitude 10° S. and longitude 35° E., but in tracing the rivers rising in that neighbourhood we are either landed in the Tanganyika (which has no connection with the Nile) or carried down the Congo to the Atlantic Ocean. Piaggia's "great lake," though reduced by Schweinfurth to the dimensions of a little pond, still retains its pristine importance on the map. The political colouring, too, leaves much to be desired. Why, for instance, should Tripoli and Fezzan, which are subject to the same ruler, be tinted in different colours? Why has not Barka been separated from Tripoli, seeing that it is an independent province since 1869? and why, above all, are we kept in the dark respecting the present extent of the Egyptian dominions? Surely the military posts established by Sir Samuel Baker on the Upper Nile might have found a place on a map of this kind; and there ought, we think, to have been some indication of Berbera, opposite Aden, being held now by Egypt.

We might easily have pointed out a number of other errors, if we had been so disposed, but we forbear. We have already said that the plan of the work is good, and if carefully revised by a competent person the Atlas might yet be converted into a very useful work. In its present condition it is, in many respects, altogether untrustworthy.

The same series of maps, with the exception of the physical and commercial map of the world, has been brought out by the publishers as an "Educational Atlas of Modern Geography." * This edition likewise labours under the defects noticed above, and, as a matter of course, lacks that clearness and simplicity which are essential in a work intended for school use.

Case's Map of the United States.†

This certainly is the finest map of the United States hitherto brought out by an American publisher. Our readers, however, must take this remark *cum grano salis*, for we do not by any means desire to convey the impression that the map before us is a superior specimen of cartography. A work of this kind takes a considerable time to engrave, and we do not, therefore, expect to find embodied in it the results of the very latest explorations. Still, we believe the draughtsman might have improved more largely upon Petermann's and Bartholomew's maps, brought out some years ago. As far as the territory of the States is concerned, however, the map is fairly correct, and though far inferior to Petermann's as regards the delineation of the physical features and as a work of art, it possesses the advantage of showing the county boundaries. The whole of Mexico (with the exception of the peninsula of California) has been copied from Kiepert's map of Tropical America. This map was brought out in 1858, and none of the important publications issued since then have been consulted. This certainly is inexcusable. The railway to Mexico is the only addition made to Kiepert's map (the omissions are too numerous to mention), and even that has been inserted incorrectly, though information on that point, we should say, could have been procured easily. The delineation of the ground (by Messrs. Wurster and Randegger, of Winterthur) leaves much to be desired. The engraver, led away by the success attained by the Swiss Federal map, has thought proper to introduce an oblique light, which is by no means suited to a map of this kind. The vertical light, as introduced by Lehmann, is certainly that best adapted to topographical drawing. Its advantages may be clearly perceived by comparing the map before us with that of Petermann, for whilst in the latter due prominence is given to the Pacific slope of the great plateau, the former reverses the case, and shows a boldy shaded interior slope. We are by no means of opinion that Lehmann's system is incapable of further improvement, but would merely warn cartographers against an indiscriminate introduction of oblique light, on the assumption of its being more natural. There are cases when it may be employed most successfully, but as a rule the vertical light offers most advantages and is, after all, as natural as the other, particularly when it is a question of delineating countries under the equator or on our northern hemisphere.

Case's map has been neatly engraved and printed in colours, by Messrs. W. and K. Johnston, of Edinburgh.

French War Office Map of Mexico.*

Since the days of Alexander, military expeditions have largely contributed to an extension of our geographical knowledge. The French expedition to Mexico in 1861-67 is no exception to the rule. Each column of troops was accompanied with an officer specially charged with the survey of the route and the collection of topographical information, and in this manner routes having a total length of 17,500 miles, and extending into nearly every state, were surveyed. The valuable materials thus collected were subsequently laid down on an uniform scale of 1 : 500,000, and it was proposed to embody them in a general map of the whole of Mexico on half that scale. The latter, though commenced, has not been completed, and we are forced to rest content for the present with a map on a scale of 1 : 3,000,000, compiled by Captain Niox of the French Staff. The compiler has done his work well, and it may fairly be described as the most correct and trustworthy map of the country which we at present possess. The hills, printed in brown, are one of its most satisfactory features, and convey a clear notion of the orography of Mexico. We trust the French Government may be induced to publish the original *croquis* of its staff officers, if not a map of the entire country on a larger scale (say by photo-lithography), for otherwise much information laboriously collected will be lost to science for evermore.

Basch's Atlas of New South Wales.†

This atlas, we are told, is the first ever produced in the colony; for this reason, and in order not to discourage the spirit of enterprise of Colonial publishers, we feel bound to deal tenderly with it. It contains a road map of the Colony, and separate maps of the nineteen settled counties. The latter show the positions of the principal post towns, with their populations and distances from Sydney, as well as the villages, roads, railways, and telegraph lines. They indicate likewise the mines and quarries, distinguishing between gold, silver, copper, lead, quicksilver, iron, coal, manganese, marble, slate, kerosine shale, and diamonds, vine districts, &c., whilst copious marginal notes form a sort of gazetteer of the entire colony. The maps are by no means perfect specimens of cartography, but they have evidently been prepared with great care, and cannot fail to be exceedingly useful to all who are interested in the present position of New South Wales.

E. G. Ravenstein.

* The Edinburgh Educational Atlas of Modern Geography. 33 maps. London and Edinburgh, 1874. 10s.

† Case's map of the United States, with the British possessions, Mexico, and part of the West Indies. Scale, 1:3,000,000. 9 sheets. Hartford, Con. (Edinburgh, Johnston), 1874. Price £3 10s.

* Carte du Mexique, dressée au Dépôt de la Guerre, par M. Niox, Capitaine d'État Major. Scale 1 : 3,000,000. 2 sheets, with notes. Paris, 1874 (London, Trübner).

† Basch's Atlas of the settled countries of New South Wales. 20 maps. Sydney, 1873 (London, Trübner and Co.).

New Maps.

Karte des telegraphischen Weltverkehrs. (Telegraph Map of the World, published by the International Telegraph Office at Bern.) 4 sheets. Bern, 1874. 4s. 6d.

Map of the Countries around the Arctic Pole, with the Isothermal Lines for January, July, and the whole year. By H. Kiepert and H. W. Dove. Berlin, 1874. 1s.

Reymann's Topographical Map of Central Europe. Sheet 128 (Leipzig). Glogau, 1874. 1s. 6d.

FRANCE.

Carte physique, politique, et administrative de la France. (General Map of France, showing the railways, &c.) Drawn by A. Vuillemin, under the supervision of L. Bonnefont. Paris, 1874.

Carte des chemins de fer de France. (Railway Map of France.) By Erhard after Bonnefont.) Paris, 1874.

Carte du département de la Gironde. (Map of the Gironde showing boundaries, towns, vineyards, &c. Revised in 1873 b E. Pagnan.) Paris, 1874.

Specimen de la Carte du département des Vosges. Par Erhard Scale 1 : 80,000. Paris, 1874.

Carte administrative du dép. de l'Aube. Scale 1 : 40,000. 18 sheets. Paris, 1874.

Carte du dép. de la Dordogne. Bergerac, 1874.

Alpes maritimes. Par A. Vuillemin. Paris, 1874.

Carte hydrologique du dép. de Seine-et-Marne. Par Delesse. 2 sheets. Paris, 1874.

Jacquot (E.) et Raulin (V.) Carte géologique et agronomique du département des Landes. Paris, 1874.

Méa. Atlas topographique agricole et géologique du département de la Corrèza. Paris, 1874.

Carte géologique de l'arrondissement de Segré (Maine-et-Loire). Par M. Danton. Paris, 1874.

Carte orographique, stratigraphique et géognostique d'un fragment de la chaine de Lomont entre Besançon et Beaum-les-Dames. Par A. W. Parandier. Paris, 1874.

L'Auvergne á l'époque antéhistorique. Clermont-Ferrand, 1874.

Atlas national. Plan de Bordeaux. Par R. Barbot. Paris, 1874.

Ville des Sables-d'Olonne. Nantes, 1874.

GERMAN EMPIRE.

Messtischblaetter (Plane table sections) vom Preussischen Staate. Surveyed by the Prussian General Staff, published by the Board of Trade. Scale 1 : 25,000. Sheets 231-234, 248-250, 266-269, 280-288. Berlin, 1874. 1s. each.

Generalstabskarte von Preussen (Staff Map of Prussia) 1 : 100,000. Sheets 168 (Berlin), and 299 F. (Kraftsolms), 287 D. (Altenkirchen). Berlin, 1874. 1s. each.

Becker (F.) Höhenschichtenkarte des Grossherzogthums Hessen (Contoured map of grand-ducal Hesse) 1 : 250,000. Darmstadt, 1874. 6s.

Specialkarte der Umgegend von Schwerin (map of the environs of Schwerin, prepared in the Mecklenburg Survey Office). 1 : 25,000. 4 sheets. Schwerin, 1874. 6s.

Neumann (P.) Plan der Umgegend von Breslau (environs of Breslau) 1 : 25,000. 4 sheets. Breslau, 1874. 3s. 6d.

Neuester Plan der Stadt Augsburg (Plan of Augsburg). Augsburg (Rieger), 1874. 1s. 3d.

AUSTRIA.

Kozenn (B.) Oro-hydrographical Atlas of the Austro-Hungarian Monarchy. 12 sheets. Vienna, 1874. 1s. 8d.

NETHERLANDS.

Abel (F. E. L. A.) Kaart van het koningrijk der Nederlanden (Map of the Netherlands, showing the system of fortifications, and published by the Country Defence Association. Scale 1 : 200,000. 6 sheets. Utrecht, 1874. 16s. 6d.

Sloten (P. K. S. J. von). Topografische kaart der gemeente Arnhem (Arnhem and environs) 1 : 10,000. 4 sheets. Arnhem, 1874. 8s.

Ribeiro (Duarte da Ponte). Carta do imperio do Brazil, reduzida no archivo militar, em conformidade da publicado pelo Coronel C. J. de Niemeyer em 1846, e das especiaes das fronteiras com os estados limitrophes organisados ultimamente. Rio de Janeiro, 1873. 1s. 3d.

Log Book.

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The Arctic Manual.—Nearly the whole of the portion undertaken by the Geographical Society is now passing through the press. The geographical section consists of papers by Dr. Robert Brown on the physics of Arctic ice, on the formation of fiords, and on the Greenland glaciers; papers by Baron Wrangell and Dr. Rink on Smith Sound; a paper by Admiral Irminger on Arctic currents; and a most valuable contribution by Admiral Collinson on the ice along the coast of North America. The ethnological section comprises a complete list of all places on the east and west coast of Greenland, with Eskimo names and meanings, Norman ancient names, Danish names, names on the Admiralty chart, and latitudes, and remarks; papers on the migrations of the Greenland Eskimos and on the Arctic Highlanders, with a sketch of the Eskimo grammar and classified vocabularies; a paper on the descent of the Eskimo by Dr. Rink; a report on the Tuski and Western Eskimo by Dr. Simpson; a list of names of places of the Western Eskimo, by Admiral Collinson; the report of the Anthropological Institute on the anthropological results to be obtained by an Arctic Expedition; with a series of questions by Colonel Lane Fox, Mr. Tylor, Mr. Boyd Dawkins, and others.

The Naturalists of the Arctic Expedition.—Captain Fielden, the naturalist who has been appointed to the 'Alert,' has arrived in England from Malta, where he has been serving for the last eighteen months. He has a thorough acquaintance with the science of ornithology, and has made the birds of the Faröe Islands his special study. The medical officers of the 'Alert' are also well qualified as naturalists. Dr. Colan is an officer of high scientific attainments, and Dr. Moss is a good botanist and also an excellent artist.

Mr. Henry Chichester Hart, the botanist appointed to the 'Discovery,' has published an enumeration of the flowering plants and ferns in the Arran Islands, Galway Bay; in which he adds about twenty-five indigenous species to those previously known. Mr. Hart is a son of Dr. Hart, one of the Senior Fellows of Trinity College, Dublin.

Photographs of the Austro-Hungarian Arctic Expedition.—Mr. Bruckmann (28, Henrietta Street, Covent Garden,) is about to publish a series of twelve photographs illustrating the voyage of the 'Tegethoff,' and Lieutenant Payer's adventurous sledge journeys. The photographs are from paintings taken from Payer's admirable water-colour sketches, and they convey a most excellent idea of the wild scenes visited by the explorers. They, indeed, form a complete history of this memorable voyage, from the parting of the 'Tegethoff' and 'Isbjorn' off Novaya Zemlya to the rescue of the retreating party by the Russian schooner.

Commodore Goodenough.—We are glad to be able to announce that the services of this distinguished officer, whose valuable report on the Fiji Islands was noticed in our last number, have been recognized by the grant to him of a Captain's good-service pension. His father, the Dean of Wells, was on the first Council

of the Royal Geographical Society, and contributed an interesting memoir on the Black Sea to the first volume of the Society's Journal. Commodore Goodenough himself became a Fellow of the Society in 1863, and during the course of his active service in many parts of the globe, he has ever taken a lively interest in the advancement of the Society's objects. Four of the officers who have been selected to serve in the Arctic Expedition received their best training under Captain Goodenough in the 'Victoria' and 'Minotaur'; and much good surveying work has been done under his auspices by the officers of the 'Pearl.' The period of his command on the Australian Station will be one in which no opportunity will be lost to advance geographical knowledge and to complete useful surveys.

Indian Marine Surveys. — Various circumstances have served to delay the commencement of these operations. Writing under date 10th February, Captain Taylor says—"It is now arranged that the 'Clyde' steamer, under Commander Ellis, R.N., will examine some of the Laccadive Islands, and then proceed to Tuticorin and the Paumben Pass, where she ought to arrive about the 1st of March. She will then make arrangements for the 'Constance' to be towed through the channel into Palk Strait; after a few days' sounding there, the 'Clyde' will prosecute her journey, calling at Madras, or Koringa, and being due at Calcutta on the 21st of March. The first duty of the 'Constance,' under Commander Chapman, late I.N., is a survey of Kolachul Port on the Travancore coast, a duty which will occupy her till the middle of March. Then she is to go through the Paumben Channel, and be engaged upon the survey of Palk Strait, and, perhaps, the shoal of Moelitivó, on the Ceylon shore, till the middle of May, when the Madras cyclonic period is past. After witnessing the first burst of the south-west monsoon at Paumben she will proceed to Coconada to remain there till the end of August, and carry out a fresh survey of the bay.

New Chart of the Makrán Coast.—The new chart of the Makrán Coast, the seaboard of Balúchistan, hitherto little known, but which has lately assumed importance, owing to the establishment of telegraphs along it, and to the Persian boundary question, has been completed by Lieutenant A. W. Stiffe, of the late Indian Navy, who has been employed on this work for some time by the India Office. It has been published by the Admiralty, and is now available for the use of the public. It is a neatly engraved sheet, and will, doubtless, meet all the requirements of the navigator. A small book of detailed sailing directions for the coast, to accompany the chart, has been written by the same officer, and is now passing through the press, also under the supervision of the Hydrographer. It will be valuable to all seamen who have occasion to touch on or pass near these shores. In addition, a new edition of the Admiralty Persian Gulf Charts and 'Pilot' has been prepared in which the orthography of the names has been revised according to a system approved by the India Office as well as by the Admiralty.

News from Eastern Turkistan.—The last number of the Russian official paper of Tashkend brings some interesting news from the dominions of Amir Yakub Khan. First we must note the rather curious version the Russians get concerning the embassy of Sir Douglas Forsyth. Out of the 300 (!) members who accompanied that embassy, we are informed 150 returned to India, and the other 150 remain in Kashgar and Yarkand, in order to assist that warlike prince in manufacturing arms — of course, against Russia. There had arrived, besides, a caravan of 300 horses, laden with valuable goods, the owners of which, however, declined selling anything, as they expected another caravan that remained behind. The Tartar merchants who went to Yarkand were told by the English that they intended to make the first offer to the Amir, and then to sell the rest to officials and traders.

In reference to political news, we hear that the people, as well as the soldiers, begin to be dissatisfied with the Amir's rule. He puts his greatest confidence in the Tungans, with which nation he entered into nearer relations by marrying several of its daughters. It is the want of confidence in his army which inspires him with respect towards the Russians. He fears their approach very much, and it was for his personal safety that he erected and fortified two Tash-kurgans (stone forts), one near Kashgar and the other near Khotan.

Of much greater importance are the accounts coming to us through Russian scouts from Western China, about the Tungans, and the movements and operations of Yakub Khan in those regions. The Russian authorities at Kuldja received the following news by a Tungan named Yauwan Kho, who towards the end of last year had made his escape to Russian territory. The Tungans, under the sway of the ruler of Kashgar, are governed by some of their own countrymen. In Manassi and Urumtsi perfect peace prevailed at the end of last year, and all communication with the Chinese was totally cut off. The entire population in these parts is said to be in a pitiful condition, owing to the exorbitant extortions of the Kashgar army.

Turfan is in the hands of a superior officer of Sart origin, named Törüma, and contains a garrison of 500 Kashgar soldiers. A similar number is stationed at Tokhtasun, while the pass in the Dabin Mountains between Urumtsi and Turfan is guarded by 200 men. During the last year about 6000 Tungans arrived from Komul in the last-named towns, and a part undertook foraging excursions against the nomadic Kalmüks in the north, returning with a considerable booty in cattle, for which act, however, they were absolved by Yakub Beg, on payment of a sum of money. Similar expeditions were also undertaken against the Chinese troops at Suzanza and Shi-kho. There is nothing like a regular army among the Tungans, and their weapons are of the most primitive description, consisting mainly of cudgels, spears, a few matchlocks, and a little gunpowder brought from Komul. The situation of the Tungans is, on the whole, by no means an enviable one, if we only consider the heavy taxation imposed upon them by Amir Yakub Khan. These they are compelled to pay in silver at the beginning of the year. It is also reported that many of them—to escape from the constantly threatening Chinese—intend to emigrate, some to Kashgar, and some to Kuldja.

Concerning the Chinese-Russian border territory, and particularly the strategically important Shi-kho, the latest accounts are of an exceedingly sad nature, on account of the universal poverty there prevailing.

Around Shi-kho there are six fortresses; of these two are guarded by 500 Chinamen, and by 500 other troops, partly from Kuldja, partly from its environs, most of them being refugees. The garrison of two others of these fortresses consists of 1000 men, partly Manchus, partly Mongols; while the last two are occupied by Kalmüks. The chief command is in the hands of Shu-Amban, a Manchu, and Su-Amban, a Kalmük. The regular army usually lies in Shi-kho, and is occupied in watching the border. It is reported that a concentration, on a larger scale, of the regular army, commanded by two officers—Shushu-gun and Djinditun—is going to take place at Suzanza. Otherwise the Chinese keep strictly on the defensive. In regard to their future plans of campaign, it is stated that those stationed at Barkul and Kamul will soon be set in motion towards Kashgar, while others are preparing to march against the Tungans of Urumtsi and Manassi. The Chinese seem to be willing to extend their propaganda even among the Buddhist Kalmüks, subject to Russia; if so, they are labouring under a grave mistake, for wherever the Russian bear has planted his paw, there the Chinese dragon will never find a foothold. A. VÁMBÉRY.

Captain Trotter on the Drainage of the Pamir.—Captain Trotter's geographical memoir, prepared to accompany Sir Douglas Forsyth's report on the recent Kashgar mission, is now passing through the press. In his journey over the Little Pamir he ascertained that the lake on this table-land, called Barkut Yassin by the Mirza, is one of the sources of a river which is called here the Aksú, and afterwards the Murghábi, and which joins the Oxus near Wámar, and is in all probability the principal source of that river, as has already been conjectured by Colonel Yule. The furthest point reached by Captain Trotter to the west is Kila Panja; but fortunately he was able to send one of his native surveyors down the Panja River for a considerable distance. The man first went to Ishkashim, so far travelling along a route which is well known from the journals of Wood and the Mirza, and then struck northwards into a region that was altogether unknown, and followed the downward course of the Panja River for a distance of nearly 100 miles, finding its direction to be in reality very different from what has hitherto been conjectured and represented on the best maps of these regions. He reached Kila Wámar, in Roshán, but was unable to go down the river any further. An exploration has, however, been since made from Fyzabad and Koláb up the river, to a point which is believed to be at no great distance from Kila Wámar, by Colonel Montgomerie's Havildar, who is now returning from Kabul with his journals. He writes that he has suffered great hardships, and lost some of his papers; but if enough evidence is forthcoming to determine the course of the Oxus from Kila Wámar down to the plains of Koláb, a problem which is of the highest importance both politically and geographically will be solved.

Captain Burton on the Outlet to Tanganyika.—In his interesting geographical notes, published in the *Pall Mall Gazette* on March 25th, Captain Burton, speaking of Lieutenant Cameron's discoveries, says—"The gallant young explorer has so thoroughly surveyed and fixed not only the details, but the trend and shape of that great reservoir, that he amply deserves to be entitled SECOND DISCOVERER OF THE TANGANYIKA." Captain Burton at present inclines to the opinion that the Lukuga outlet is a surplus drain, acting mainly during the period of inundation, and becoming an influent during the dry season.

Darien.—The cessation of the pearl fishing has made it a matter of great importance to the State of Panama, with reference to the continuance of commercial prosperity, that some other product of equal value, and for which there is a constant demand, should be discovered on the isthmus. Hence the extraction and export of *caucho* (India-rubber) is receiving much attention. The trees are found in great abundance in the territories of the Darien Indians, but these independent tribes are inclined to obstruct the work of the *caucheros* or India-rubber collectors, and to resist an entrance into their forests. The New Granada Congress has authorized the Government to station a force of national troops in Darien, to protect the *caucho* industry, but they have not yet arrived. Meanwhile the merchants engaged in the trade have sent about 300 labourers up the Darien River in boats, to a place on the Chucunaque, where they will be stationed, and whence they will occupy and work certain localities as far up as the river Chucurti, an affluent of the Chucunaque. The *caucho* trees (belonging to the genus *Castilloa*) are said to abound in dense groups in the forests drained by the head waters of the Chucunaque and Chucurti; and so long as the tapping of the trees is done on an intelligent principle, and under due superintendence, the supply will be inexhaustible.

Correspondence.

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THE ETYMOLOGY OF "TURKMAN."

To the Editor of the "GEOGRAPHICAL MAGAZINE."

SIR,—There seems to be an almost common consent among the authors of our standard books upon the history of Central Asia in regard to the etymology of the name Turcoman or Turkman, and yet I believe it to be ill-founded and even to have confused our knowledge of the ethnography of Central Asia very much.

The etymology generally followed is the one given by Raschid-ud din, the court historiographer of the great Ilkhan of Persia, Gazan Khan, and also by Mirkhond. They tell us that the name is not an old name, and that before the Turks came in contact with the Persians, and while they yet wandered in their own steppes, they were known simply as Turks, each tribe having its own specific name, but Turk being the generic title of all. When they began to cross the Jaxartes into Mavera ul nehr and Persia, and began to have children there, these acquired the look and appearance of the indigenous Tajiks. The latter thereupon gave their new neighbours the name of Turkmân *i.e.*, "Resembling Turks" (see Erdmann's Temudschin der Unerschutterliche, page 42, note 1). This etymology, which has a very eastern look, will not bear much criticism. If Turkman had not been the indigenous name used by the Turcomans themselves, but a name merely applied to them by the Persians, it might have been reasonable, but that a very important and numerous race, consisting of many tribes, should adopt such an extraordinary name as "Resembling Turks" is incredible. To the Turkmans their Turkish descent and Turkish idiosyncrasies are matters of immense pride, and this being so, that they should proclaim themselves a bastard and a mongrel race, and adopt a name which would compromise the purity of their descent, is quite

monstrous to those who have studied Turkish habits of thought in such matters. Nor can we conceive, even among more servile races, how a whole nation which had formerly styled itself Turk, should, in consequence of such very small changes as separate the Turcomans from the Kazaks and other Turks of the proper Turkland, entirely alter its name, and alter it in such a weak fashion. Klaproth, who, nothwithstanding some errors (and who among us is so free from them), had a wonderful instinct in these matters so long ago as 1823, suggested a doubt as to whether the received Persian etymology was a sound one, and expressed himself as unable to receive it, inasmuch as the Turcomans who still live on the Jaxartes, and who are unmixed with Tajiks, also use the name (Asia Polyglotta, 217).

Fortunately another etymology is available, and one which has not the same defects. Neshri, the native historian of the Turks—one well versed in the Turkish language, and not likely to have been led astray by etymological fables that would commend themselves to the lively imagination of the Persians—tells us that Turkman is compounded of *Turk* and *Iman*, that is, believer (see Von Hammer's *Geschichte des Osmannischen Reiches*, i., 37, note 3, and Ali Suavi's *Memoir on Khiva*, 31). This etymology is not only probable, but almost certain, and the account Von Hammer gives of its origin is very satisfactory. He tells us that the first body of the Oghuz Turks who became Mussulmans was a section of 2000 under the command of Salur, a descendant of Tak Khan, and that this was in 960. He was afterwards called Chanak or Kara Khan, while his people, to distinguish them from the unbelieving Turks, were styled Turkmans" (Von Hammer, *op. cit.* i., 37). We know what a magical effect the introduction of the faith had upon all the Turkish tribes. What an immediate change there was in their nomenclature, and in many of their habits, and what fanatical disciples they became. We can hardly realize what a barrier the possession of the faith created between the proud convert and the equally proud unbeliever; we have only to read the correspondence of the great Khan of the Golden Horde, Uzbeg Khan, with the Mameluke Sultan of Egypt, to guess what fierce fanaticism it introduced into the steppes of Turkistan, and how very proud he and his people were of being within the pale. We are not surprised, therefore, that the converted Turks should have changed their name, and qualified it by such a proud adjective as believer, just as the Kumuks after their conversion were styled Kazi-Kumuks in opposition to Kafir-Kumuk applied to their unconverted brethren. The name Turkman, therefore, is of small ethnic value, it does not enable us to discriminate tribes of various origins. It included, properly, believing Turks of whatever origin, and only became limited to the Turks of Khorassan and its border when other believing Turks acquired specific names. It was a generic name including all Mussulman Turks. This being so, it is interesting to inquire what generic name was applied to those Turks who were still unconverted. The most usual name so employed was, I believe, Oghuz. An Oghuz Turk did not always mean a Turk of some particular tribe named Oghuz, but was apparently used indiscriminately for all the nomadic Turks. The Comans were so called; the ancestors of the Osmanli and Seljuki were so called; and the name is used generically by Abulghazi, who tells us they were divided into several sections, as the Kiptchaks, the Kankalis, the Karluks, &c., &c. All these, he tells us, were subdivisions of the Oghuz. Oghuz, then, may be properly used as the correlative of Turkman; the latter meant the believing and settled Turk, the former his unbelieving and nomadic brother. If this conclusion be kept constantly in view, it will assuredly clear up very considerably the history of the early Turkish invaders. With your permission I should like to say something more about the Oghuz Turks in another letter.—Yours, &c HENRY H. HOWORTH.

Proceedings of Geographical Societies.

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ROYAL GEOGRAPHICAL SOCIETY.

Meeting of February 22nd 1875.

Discoveries in Eastern New Guinea by Captain Moresby and the Officers of H.M.S. 'Basilisk.'

The President, Sir Henry Rawlinson, took the chair at 8.30 P.M. In introducing Captain Moresby, the author of the paper about to be read on New Guinea, Sir Henry informed the meeting that at the commencement of the previous session an interesting letter from the same author had been read, giving a very graphic account of certain discoveries which he had made in New Guinea. He was now present, and would give them an account of a more recent visit to that island, during which he had accumulated a large amount of information, political, ethnographical, commercial, and geographical. Up to the present time, whenever he (the President) had been taunted with the probable exhaustion of the work of the Society, he had always been able to fall back upon New Guinea as an unknown land, which would afford material for many years to come. He was really now afraid that that stronghold of the unknown was fading from their grasp, for not only British officers, but Italian and Russian travellers, were invading that *terra incognita* on various sides. Still, he was very happy to find that the lion's share had fallen to the lot of England, and that, as far as such appropriation was of any national importance, Captain Moresby had appropriated all the south-eastern, and apparently the most valuable portion of the island.

After a few preliminary remarks, Captain Moresby said he felt somewhat amazed to think that the very outline of the third largest island in the world should have been unknown till now, and the navigation between its north-east coast and Australia invested with such imaginary dangers as to prevent communication between these shores.

East New Guinea ends not in a wedge, as hitherto imagined, but in a huge fork, the lower prong of which is cut up into an archipelago of islands. Between these new islands and the peninsula which forms the northern prong a sheet of water lies, about 45 miles long and 12 to 18 in breadth, named by Captain Moresby Sir Alexander Milne Bay.

This new archipelago consists of about sixty islands, large and small, the largest of which, Moresby Island, is about 36 miles in circumference; Basilisk Island nearly as large; Hayter and Heath Islands somewhat smaller; many of the remainder being from 4 to 12 miles in circumference, and inhabited. These islands are mostly lofty and volcanic, and richly wooded.

Moresby Island, a fair type of the rest, rises boldly from the sea to a height of 1600 feet, rich in fruit-bearing and timber trees, whose dark tropic green is relieved by the various earth-tints of the cultivated and terraced land, and the lighter greens of yam and taro. Here and there the eye rests on great grassy slopes that look like English meadows ready for the scythe; but a giant scythe indeed would be needed to cut them, for this grass is 12 feet high. On the shore are scattered the most singular dome-shaped grassy hillocks, which made for us natural surveying stations. On the water-line the shore is broken into fine deep-water bays, some five of which are good harbours. Villages cluster to the edge of the calm waters, and here and there a coral reef runs out, from which the dusky fishers ply their task.

The 'Basilisk' has had the honour of fixing the position and laying down the coast-line of the D'Entrecasteaux group, which was seen from a distance by D'Entrecasteaux ninety-four years ago, as he sailed in

search of La Perouse; but he never visited the islands, and saw them on the east side only.

We have proved them to consist principally of three large islands, separated by narrow straits from each other and the mainland of New Guinea; and as their first surveyor and visitor, I have taken leave to name the islands Normanby, Fergusson, and Goodenough, and the straits Ward Hunt, Goschen, Dawson, and Moresby. These islands extend north and south about 90 miles, and afford harbours and anchorages.

Captain MORESBY then gave a brief account of this survey. Accompanied by Lieutenant Mourilyan, an engineer, and seven men, they started on March the 7th in a steam-pinnace, with a whale-boat in tow, loaded with fuel and provisions for a week. Leaving the ship in Dawson's Straits, and steaming to the westward, they passed close under the high volcanic mountains of Fergusson Island, which bound the strait to the north. Turning the western point of Fergusson Island, they found themselves at the entrance of a fine strait separating Fergusson from Goodenough Island. Both these islands, with their forests topped by bare grey peaks, are grandly picturesque objects, Mount Goodenough rising magnificently to a height of nearly 8000 feet. The sides are cultivated in patches to a height of about 2000 feet; gradually its woods give place to barrenness, and its summits stand bare and knife-edged against the sky. Mountain torrents dash down its ravines and flash out at times from their dark-green setting like molten silver.

They were compelled, owing to the number of pillars of mushroom coral, which bristled in every direction within a few inches of the surface, to seek anchorage in 20 fathoms of water outside these coral pillars, on which a dangerous surf was breaking.

Next day, through want of fuel, they failed to completely circumnavigate Goodenough Island, which was found to be the home of the megapode and a variety of exquisitely-plumaged birds; also of parrots and lories.

On landing at a large village in Moresby Straits, the married women alone advanced to meet the English, the men appearing, but keeping back in evident timidity; but the presents distributed amongst the women soon brought the men about them, all anxious to exchange their stone axes for rusty iron hoop. So entire was Captain Moresby's confidence in the peaceful disposition of these people that, accompanied only by a seaman, he visited their inland plantations, and found large enclosures, well fenced in with bamboo, producing tropical fruits, yams, sweet potatoes, Indian corn, and sugar-cane. The sago-palm grows most abundantly here, and the natives mash the sago in immense troughs, which at first he took to be worn-out canoes.

The great Louisiade reefs, hitherto deemed an impenetrable barrier between Australia and North-east New Guinea, present, in reality, a wide open gateway, through which ships may safely pass from Australia to North-east New Guinea, and enter on a shorter course to China. Previous to this discovery three routes lay open between Australia and China. Of these, the shortest, or New Ireland passage, ran inside the Solomon Islands, and leaving the Louisiade Archipelago to the west, went between New Britain and New Ireland, and so on to China. The new route lies to the west, instead of the east of the Louisiade reefs, and shortens the distance by about 300 miles, without increasing the danger. Eventually the trade with China will be carried on by steamers, and this, the shortest route, will doubtless be *the* route. Near Teste Island the Louisiade reefs sink from the surface to a depth of 10 or 12 fathoms, and so continue for more than 100 miles to the west.

To the immediate west of Teste Island ships bound by this new route pass over this sunken barrier, and here Nature has placed such striking landmarks that a land-fall can be unmistakably made. Teste Island is easily recognisable. Its peaks rise to a height of 300 feet, and look like islands at a distance. Four miles to its west stands Bell Rock, a great dome-shaped mass of rock, rising perpendicularly from the sea to a height of 500 feet, wooded over wherever a crevice affords room for a tree to grow, and marking well the entrance to the new route; it may be passed by a vessel within a stone's throw. Thence, as the ship passes between Moresby Island and Engineer's Group, not a reef lies in the way. To the north-west of Slade Island the passage lies between two reefs about 2 miles apart, and a passage of 4 miles breadth leads to the point of exit between Cape Ventenat and a reef, which Captain Moresby named Gallows Reef. The channel here is 2 miles wide, and Gallows Reef being a wash, and marked by two tree-covered islets, affords sailing-marks which remove all danger to the navigator.

Another useful gift which the 'Basilisk' has been able to present to the mariner and the merchant is the discovery of harbours on these once inhospitable coasts, to a few of which Captain Moresby briefly referred.

Robert Hall Sound, South New Guinea, in latitude 9° N., longitude 146° 3′ E., is well marked by Yule Island at its entrance. He had a great belief in the future of this noble sheet of water, seen from seaward by Captain Owen Stanley's survey, but never entered till now, by a passage found off the south-east end of Yule Island. A good, safe, clear channel leads in, and the harbour is perfectly protected, and land-locked with deep water, for hundreds of ships to lie safely. Its shores are low, swampy, and mangrove-covered, and probably unhealthy; but Yule Island, near which ships would anchor, is high and healthy ground. At the head of the harbour Hilda River issues, navigable for steam-launches, but too rapid for row-boats to ascend, destined in time to bear the valuable woods and many produces which here await the advent of commerce downwards on its rapid bosom.

Port Moresby is a safe, commodious, double haven, lying 60 miles to the east of Robert Hall Sound, at the point where the swampy coast first gives place to coral white sand and shells. This harbour was discovered, after much search in open boats, from Jane Island. Great anxiety then arose as to whether a good entrance could be found; and for two days more soundings were made far away from the ship, inside the great barrier reef. Suddenly the lead dropped 50 fathoms down, and finding no bottom the entrance was found. Two days after the ship was taken in. The outer harbour of Port Moresby is an extensive bay, surrounded by open, grassy, round-topped hills, thinly timbered with the Australian gum-tree, whilst rich tropical valleys lie between. There are several large native villages on its shores. Jane Islet, about 500 feet high, lofty and precipitous, wooded and cultivated, stands in the centre of the outer harbour, and if fortified would render it impregnable. The eastern waters are a mass of coral reefs, but the western are clear, and just the right depth—9 to 12 fathoms—for anchoring. A fine, clear passage leads to the inner Fairfax Harbour, and in this inner broad sheet of water, shut round by high land, the 'Basilisk' anchored in 5 fathoms. On its southern side from the hill under which she lay, a considerable quantity of gold quartz was taken. This port, from its healthy situation, has already been selected as the principal station of the London Missionary Society.

Pitt Bay is a fine harbour, and easily entered; it lies at the gateway of the new Austro-Chinese route at the east end of Moresby Island, embosomed by lofty hills. Hereafter, the power holding Pitt Bay will possess the key of the route. At Pitt Bay a piece of gold-bearing quartz was taken from the bed of a stream, but though diligent search was made, no more could be found.

Traitors' Bay, on the north coast of North-East New Guinea, in latitude 8° N., and longitude 148° E., offers shelter to ships trading on that coast, and possesses a navigable river with a gentle current. This river dis-

charges itself outside the anchorage, over a bar that proved impracticable to boats. Captain Moresby regretted he had not time to survey this river, for it seemed to him to lead up far into the country, and he hoped some future explorer would follow it up.

He then gave an account of their last work, which was the running survey of the unknown coast of North-East New Guinea.

On April 27th, the 'Basilisk's' head was turned westward, every mile now being a step towards home.

The first striking difference between these northern and the southern shores of New Guinea is that here there is no outlying barrier reef, and the shores, instead of shelving outwards, are steep too. The mountains generally run down to the sea, then follows a shore reef, from which the plumb-line may be thrown into 50 fathoms of water.

The coast-line is but little broken up, and affords few harbours and anchorages. Speaking generally, from East Cape to Cape Cretin, the coast-line may be spoken of as a series of bold headlands, running out 20 to 30 miles to seaward, with deep bays between.

The great Owen Stanley Range may be said to terminate at the head of Sir Alexander Milne Bay, but one of its spurs, named by Captain Moresby "Stirling Range," runs at a diminished elevation through the narrow peninsula, which terminates at East Cape. This henceforth important promontory on the world's map has no great feature to attract attention. The peninsula has gradually narrowed to half a mile in width. The Stirling Range has ceased, and been succeeded by a low, undulating forest country, sprinkled with villages, when suddenly an abrupt double-topped hill springs to a height of 300 feet.

Between Cape Ducie and Cape Frere the forest ceases, and is succeeded by an openly wooded level plateau, full of villages, backed, 2 miles inwards, by a range of sharp grassy hills, bare of wood, each defined by a belt of sharp brushwood at its base, crowding down hill upon hill, with such a curious effect as to remind one strongly of the plate in Black's 'Atlas' of all the mountains in the world. Above the height of 2000 feet the forest springs up again, and covers still higher peaks to the very top, to a height of 6000 or 7000 feet.

Cape Frere is a noble headland, dropping its huge buffalo-headed mass about 2000 feet almost perpendicularly to the deep blue sea; and the 'Basilisk' looked a mere cockboat in the huge shadow, as, almost scraping her sides against the beetling mass, she stood in to seek for an anchorage in Bartle Bay.

From Bartle Bay into the bight of Goodenough Bay, a distance of some 30 miles, the bold and fertile coast runs in a W.N.W. direction. There are some fine waterfalls at the head of this bay, flashing down the dark-green mountain-sides, and so much river-water is here discharged that the surface of the sea is quite fresh. The canoes about here are smaller; and quite a different language prevails from that at East Cape.

From the bottom of Goodenough Bay the land turns abruptly in an E.N.E. direction, and so runs boldly out to sea for 30 miles in a rich forest-covered promontory, which ends in grassy slopes marking Cape Moresby, off which are small outlying islands, surrounded by coral-reefs. From this point, looking across Ward Hunt Straits, we could still see Mount Goodenough rearing its stupendous mass.

From Cape Moresby the land trends W.N.W. for 45 miles to the bight of Collingwood Bay, the shores of which are low and densely wooded, and the depth of water decreased to 50 fathoms at 2 miles from the shore. From this point the natives became suspicious and unfriendly, and much difficulty was experienced in communicating with them. The land now runs north-east for 45 miles, till it forms a noble promontory, and terminates in Mounts Victory and Trafalgar, 3000 feet high, and Cape Nelson—names which Captain Moresby rejoiced to write for perhaps the last time on the map of the world. The natives here fled at the approach of the Englishmen, and it was observed that, although belonging to the light-coloured race, they differed in appearance from the natives of East Cape, and wore their hair in long, thin, ugly ringlets.

Cape Ward Hunt lies 40 miles to the westward of Cape Nelson; the deep bay between was named "Dyke Acland," its low, wooded shores, with the formation so characteristic of this coast, suddenly turning to the north-east, and forming a bold, wooded promontory. Eight miles to the westward of Cape Ward Hunt is Traitors' Bay.

Passing Cape Ward Hunt Captain Moresby came upon the position assigned in the charts to "Ritchie Island," so named after the naturalist of D'Entrecasteaux's Expedition ninety-four years since. No trace of any such island now exists. It is probable that D'Entrecasteaux, at a great distance, saw the high land about Cape Ward Hunt, which would then appear as islands, and thus he noted it on his chart.

Huon Gulf lies between Cape Ward Hunt and Cape Cretin, and is the last of the great bays which distinctively mark the north-east coast of New Guinea. Its shores are well populated, and the natives were friendly. Its shores are covered with a rich vegetation; and especially beautiful are the slopes of the Rawlinson Range, teeming with palms and tree-ferns, and well inhabited. From Cape Cretin to Astrolabe Gulf, a distance of 120 miles, the land trends nearly due east and west, without a break; the coast-line is backed up by the great Finisterre Mountains, the two highest peaks of which, standing facing each other, were named Mounts Gladstone and Disraeli. At Astrolabe Gulf the survey terminated; but off the northern shores of New Guinea a series of deep-sea soundings were taken, finding from 1500 to 2000 fathoms 25 miles from the shore, a depth probably unequalled in any part of the world in such close proximity to the land.

The 'Basilisk' passed from Astrolabe Gulf towards Lesson Island, an active cone-shaped volcano, discharging large volumes of steam and smoke. It is densely populated, and the cultivation at its base appears very rich. The natives, a fine-looking race, crowded alongside the ship, eager to barter all they possessed for scrap-iron. Their hair is worn in a preposterous manner, confined behind in a conical case projecting 12 or 14 inches, as a horn, from the back of the head. Off Garnet Island the 'Basilisk' passed through a large body of brackish water, forcing itself seaward, and bringing with it vast numbers of gigantic uprooted trees. From this fact Captain Moresby concluded that a river of large dimensions must exist in the neighbourhood of Cape Della Torre.

On June the 2nd they reached the Dutch Spice Island of Amboyna, having thus successfully completed the survey of the last unknown coast of the habitable world.

The meteorology of Eastern New Guinea appears to be different from that previously supposed. The north-west monsoon blows from November till March, accompanied by occasional westerly gales, with fine-weather intervals. The south-east monsoon, which follows, they never found to blow continuously up to the time of their leaving the coast in May, for they experienced light variable winds and calms; whilst on the northern shores of Eastern New Guinea the south-east monsoon appears to be altogether arrested by the lofty Owen Stanley Range, the summits of which, during the month of May, were observed with heavy clouds, leading them to believe that the monsoon was blowing strongly on the southern shores of the peninsula, whilst they on its northern side were sailing in calm and waveless waters.

The barometer showed little or no fluctuation, remaining steady between 29·80° and 29·90°; the thermometer in the shade varying from 83° to 86°. The tides varied in rise and fall from 8 to 12 feet.

Captain Moresby then gave a very interesting account of the native race inhabiting the newly-dis-

covered portion of New Guinea, which he said was distinctly Malayan; but differs from the pure Malay, being smaller in stature, coarser in feature, and almost beardless. Amongst them many men were met with light hair, and a particularly Jewish cast of feature. They rise to a height of from 5 feet 4 to 5 feet 8, are sinewy though not muscular, slight, graceful, and eel-like in the pliability of their bodies. This race abuts on the black Papuan, somewhere in the vicinity of Cape Possession; but Captain Moresby did not believe that a fixed line of demarcation existed, for in Robert Hall Sound both types of race were present, and the natives varied here amongst themselves in colour, stature, and feature.

This new race appeared to inhabit the whole of the eastern peninsula of New Guinea on its northern and southern shores, and also the newly-discovered archipelago of islands adjacent, and were found to be very kindly, greeting Captain Moresby and his party with a wondering welcome.

He inclined to the belief that these people have not any religious feelings; certainly no external evidence of such was observed; nowhere were idols to be found. One action only seemed to have a religious tendency, namely, their universal custom of bringing a village dog and dashing its brains out in our presence, after which ceremony they showed perfect friendliness. They bury their dead in a respectful manner in the ground, and build small thatched huts over them, some of which are rudely carved and fenced-in with a bamboo palisade.

He considered these Malays a more civilized race than the Papuans, possessing as they do the art of pottery, still unknown to the latter. As fishers they far excel the Papuans: the latter fish only with hook and line and the barbed spear, whilst the former make fishing-nets of various sorts with great skill, and are great adepts in their use. Their weapons consist of stone tomahawks, clubs, axes, spears, heavy wooden swords, and hair slings.

Their houses and those of the Papuans do not differ materially. They are built on poles sometimes 12 or 14 feet from the ground, and consist of one large tunnel-shaped room, well thatched over. A pole, with notched steps, leads from the ground to a small landing-place or verandah, behind which is the small opening leading into the interior. They are rude but successful cultivators of the ground; their food is very plentiful, consisting of fish, yams, taro, fruits, and, on great occasions, pork; and they do not make any kind of intoxicating drink. This plenitude of food may have some influence in checking a desire for cannibalism, which does not prevail largely amongst them, though, from the fact that some were seen wearing bracelets of human jawbones, and necklaces made of the spinal vertebræ, which had evidently been subjected to the action of heat, Captain Moresby suspected that cannibalism was not wholly unknown to them.

These people are affectionate to their children, and they did not, like most savages, keep their wives in the background, but allowed them to come out freely, and have a voice in trading. The men are but slightly tattooed, but the women tattoo all over, sometimes in graceful patterns. The men paint grotesquely with ochres, and sometimes shave the head and paint it, and the whole body to match, of a shining black, with charcoal and cocoa-nut oil. The women crop their hair short, the men wear theirs long and frizzed, and all disfigure their mouths with chewing the betel-nut, except the younger women. The men wear a waist-cloth only, the women the usual South Sea garment, the short grass petticoat or "ti-ti."

In the discussion which followed the reading of this paper, Captain EVANS, R.N., Hydrographer to the Admiralty, said he did not think our present knowledge of New Guinea was sufficient to warrant the belief that it was becoming a well-known land, for, literally, nothing was yet known about its interior. He himself was engaged, some thirty years ago, for two or three seasons in Torres Straits. At that time the Gulf of Papua was not laid down upon the charts. The coast he visited in H.M.'s surveying-ship 'Fly' was for 100 miles evidently the delta of some great river, with many fresh-water openings from 2 to 5 miles wide. The fresh water at one opening was observable 12 miles from the land. On several occasions the boats attempted to penetrate some little distance up these channels; but the natives were so numerous and hostile that it was difficult to get past them. One of the native houses was measured, and found to be 300 feet long, and 70 feet wide. Such houses were numerous, and the population must, therefore, have been great, and the country very fertile to feed such numbers. They were entirely different in character and appearance from those whom Captain Moresby had described. They were the true Papuans; black, fierce in appearance, still fiercer in manners, and all efforts to conciliate them were perfectly useless. The large body of fresh water seen by him must be the drainage of a great part of New Guinea, and there was room enough in the interior for a river 350 miles in length, in a straight line to the north-west. It must drain all that immense mass of mountains, some 16,000 feet high, on the north-west; and the only way to learn anything about the country would be to ascend that great water highway. It was of no use merely touching the shores, because the forest prevented any exploration more than a few miles inland. This was a case in which the several colonies of Australia might well unite in a common effort to send a small expedition to ascertain what New Guinea really is like. It would never be known from the attempts of Russian, Italian, and general travellers, although these had done wonders. A couple of small, light-draught, well-armed steamboats could readily venture into the interior, and really ascertain something about the country.

Dr. MULLENS said that, five years ago, the Directors of the London Missionary Society had their attention drawn to the shores of New Guinea, and since then various missionaries, who had had long experience in the South Seas, had visited different parts of the coast. About two years ago they were enabled to commence systematic operations there, and established their head-quarters at Somerset, Cape York. It was an interesting fact that, in the great projecting eastern point of the island, the two races of Papuans and Malays were both found; and Mr. Murray, one of the missionaries, was of the same opinion as Captain Moresby—that in the neighbourhood of Yule Island the fusion of the races took place. In a letter which he had recently sent home, Mr. Murray had, however, stated that near Port Moresby the population was unmixed, and were exactly similar to the inhabitants of the Navigators' Islands. Though but little was yet known of New Guinea, what had been done was by no means to be despised.

Mr. P. L. SCLATER said that New Guinea was of special interest to naturalists, on account of the many wonderful forms of animal life that prevailed there, and particularly because, so far as was at present known, the birds-of-Paradise were confined to that and the neighbouring islands. Previous explorers had directed their attention only to that part of the island lying to the west of Geelvink Bay. The Dutch had dominion over the whole of the Molucca Islands, and they were the first who explored that end of New Guinea. Their earliest settlements were in Geelvink Bay, and they also partly explored M'Clure's Inlet. Then one of the great French expeditions passed some time at Port Dorey, and made some collections in natural history. Mr. Wallace also spent a considerable time there, and within the last two or three years, such were the obvious advantages to be derived from an expedition to New Guinea, that naturalists from three different parts of the world had gone there to collect—M. D'Albertis and Dr. Beccari, two Italian gentlemen; Dr. Meyer, a German; and M. Miklucho Maklay, a Russian; but they had all gone to the northern end. M. D'Albertis,

however, on his voyage back to Sydney, did touch at a place near Port Moresby, and got the skin of a very fine new Paradise-bird *(Paradisea raggiana)*. At Sydney also he purchased from one of the officers of the 'Basilisk' a small kangaroo, which he brought home and deposited in the Zoological Society's Gardens. The surgeon of the 'Basilisk' brought home a cassowary from the southern part of New Guinea, and that also was now in the Zoological Society's Gardens. Both these animals were new, and of very great interest. It was much to be regretted that Captain Moresby had not a naturalist with him, because there could be no doubt that splendid discoveries might have been made. M. D'Albertis, as soon as he heard that there was a chance of penetrating into the southern part of New Guinea, had started again from Europe, and at the date of his last letters was at Port Somerset, preparing to go across to Port Moresby, and hoping to make as fine a collection as he had already made in the northern part of the island. If any other expedition for the survey of New Guinea were sent out from this country, he trusted it would be accompanied by a naturalist.

Sir Charles Nicholson said there seemed to be very little doubt as to the existence of gold in New Guinea. That was a most unfortunate circumstance, because it would be the means of attracting a great number of lawless, reckless people from the Australian colonies, who, instead of carrying civilization and religion, and humanizing influences to the natives, would entail upon them a great deal of misery, and commit acts of violence upon those with whom they came in contact. It was therefore most important that the British Government should be alive to this fact, and should take some measures with a view of preventing lawless inroads into the island. Would it not be a proper thing for the Imperial Government to occupy some such position as Yule Island? The idea of taking possession of the whole of New Guinea and treating it as a colony was simply preposterous, for England had no shadow of a right to do any such thing, and the climate would be adverse to any European community attempting to settle there. It was, however, quite a different thing to endeavour to establish commercial relations with the natives; and if they could be taught the value of money, the means of extracting the gold from the rocks in which it abounds, the benefits to be derived from the development of the products of the island and the pearl-fishery, and if, moreover, humanizing and christianizing influences could be brought to bear upon them, under the protection of the Imperial Government, England would do honour to herself, and achieve all that could be desired with respect to those interesting races. He suggested that steps should be taken to draw the attention of the Government to the desirability of occupying some small point for protecting the traffic which would be sure to spring up by the new route between the Australian colonies and China. He agreed with Mr. Sclater in recommending that a naturalist should accompany any future expedition to the country. It was a singular fact that New Guinea might be regarded as an outlying portion of the great Australian continent, the fauna and flora being the same in general character.

The President, in conclusion, said he was quite aware that a great part of New Guinea had not been explored, but it had been tapped in so many places that it could no longer be regarded as a *terra incognita*. Dr. Meyer had actually crossed it from one side to the other, and M. D'Albertis intended to go as far inland as he possibly could. The Russian savant, M. Maclay, had also gone back to the island, so that considerable progress was being made. No doubt Sir Charles Nicholson's suggestion as to the desirability of establishing some protection there deserved great attention, and perhaps the present was a most favourable time for bringing the subject before the Government. The Protectorate of the Fiji Isles had only recently been assumed, and it would not be a very great step further to occupy some point so as to guard the line of traffic between Australia and Eastern Asia. Rumours were occasionally heard of a scheme for forming a great confederation of Australia, Tasmania, and New Zealand, but it would be long before such an idea would be realized. In the meantime all that England could do was to endeavour to spread humanizing and christianizing influences by means of her officers, her travellers, and her missionaries. No one could question that missionaries had been successful, to a certain extent, in civilizing the races with whom they came in contact, and the Royal Geographical Society was very much indebted to them for the information which they had occasionally given of the general geography of the countries they had visited.

Meeting of March 8th, 1875.

Cameron's Discoveries on Lake Tanganyika.

The President, Sir Henry Rawlinson, took the chair at 8.30 p.m. The meeting was crowded, and among those present were Mr. and Mrs. Cameron, Sir Bartle Frere, Mr. Prinsep, Mr. Galton, Major Euan Smith, C.S.I., and Mr. Allen Young.

The President, in introducing the subject of the evening, reminded the Society that at the meeting of December the 14th, a letter had been read from Lieutenant Cameron, announcing that he had circumnavigated Lake Tanganyika, and had discovered its outlet. Until the present meeting, however, the Council had not been able to bring the full result of his labours before the Society. Mr. Markham, who had always taken great interest in African exploration, had extracted the chief passages from Cameron's diaries, the entries in which were necessarily somewhat disjointed, and had formed them into a connective narrative. Tanganyika was one of the largest fresh-water lakes in the world, being 350 miles in length, and extending over a superfices of above 10,000 square miles. Hitherto it had been laid down on the maps generally in a northern and southern direction; but Lieutenant Cameron's observations, which to a certain extent were anticipated by Dr. Livingstone, showed that its real direction was N.N.W. by S.S.E.

Mr. Clements Markham then read the paper on the Examination of the Southern Half of Lake Tanganyika, by Lieutenant V. L. Cameron, R.N., compiled chiefly from Lieutenant Cameron's Diary.

The geographical work performed by Lieutenant Cameron during his voyage round the southern half of Lake Tanganyika will form the principal part of the present paper. The explorer has transmitted his journals to this country in the form of diaries, entered day by day. This is quite right, and it is the form most valuable to our map compilers, and to those whose business it is to examine and scrutinize the work. It is not, of course, a form which is adapted for reading, and it has consequently been necessary to recast the portions of Cameron's notes which are to be brought to your notice, into the shape of a consecutive narrative, at the same time using his own words as closely as possible. I have undertaken this task with some diffidence; but I hope to be able to bring before you the principal points, and to do justice to our absent countryman.

Lieutenant Cameron's discoveries did not commence with his survey of the lake. Even when travelling over trodden ground, Bagamoyo to Unyanyembe, he took regular astronomical and hypsometrical observations, and has sent home careful route-maps and journals. After leaving Unyanyembe, he selected a route to the south of that of Captain Burton, and to the north of Mr. Stanley's route, which enabled him to explore a previously unknown tract, and to make discoveries connected with the drainage-system of the southern part of the basin of the river Malagarazi, the most important eastern tributary of Lake Tanganyika.

Mr. Markham then gave some account of the route taken by the explorer, from Unyanyembe to the river Malagarazi, details of which will be found at p. 177 of our number for August 1874.

Before entering upon the details of the service that Lieutenant Cameron has done to geography, by the examination of the southern half of Lake Tanganyika, Mr. Markham recapitulated the extent to which this most interesting sheet of water had previously been examined by Burton and Speke in 1858, and by Livingstone and Stanley in 1871, and the conclusions respecting the hydrography of the Tanganyika which were arrived at by those explorers. The exact scope and nature of the work which remained for Cameron to do will then be more clearly evident.

Captain Speke crossed from Ujiji to the island of Kasenge, near the western shore, in March; and Captains Burton and Speke explored the portion of the lake north of Ujiji, in two open canoes, in April and May. Burton also collected an extraordinary amount of information from the Arabs. As the result of his exploration and inquiries, he states his general views respecting the lake. He describes it as giving him the impression that it was a volcano of depression rather than a reservoir formed by the drainage of mountains. As regards the northern half, the walls of the Tanganyika basin rise in an almost continuous curtain to a height of 2000 or 3000 feet. Burton found the water of Tanganyika to be deliciously sweet; yet a careful investigation led him to the belief that the lake receives and absorbs the whole river system of that portion of the Central African depression, whose watershed converges towards the great reservoir. Burton and Speke, owing to failure of provisions, were unable to reach the northern extremity, but they were informed that the Rusizi flowed into the lake at its northern, and the Marungu at its southern end. Burton had himself descended the incline for 240 miles on the eastern side, until he came to the shores of the lake, and had seen that the Malagarazi and other rivers flowed into it. He therefore conjectured that Lake Tanganyika had no outlet, suggesting that it maintains its level by an exact balance of supply and evaporation. He accounted for the freshness of the water by the saline particles deposited in it being wanting in some constituent which renders the salt evident to the taste. This view was always supported by our late medallist, Dr. Beke.

Dr. Livingstone and Mr. Stanley, following in the track of Captains Burton and Speke, explored the northern half of the lake in November 1871, and succeeded in reaching the mouth of the Rusizi, which was filled with large, reedy, sedgy islets. There was a current of 2 miles an hour flowing into the lake. The latitude was 3° 18′ 3″ S. On leaving Ujiji a second time, Livingstone and Stanley coasted along the east shore to the south, from December 27th, 1871, to January 2nd, 1872, as far as Urimba, where they landed.

Thus the northern half of the lake had been well explored from the Vibanga River on the east side, and Kasenge Island on the west, to the northern extremity. But, when Cameron reached Ujiji, the southern half had never been explored, and was unknown except at a few points where it had been touched by Livingstone in his various journeys.

In 1868 Dr. Livingstone reached the southern extremity of the lake, which he describes as a deep basin, with sides perpendicular and covered with trees; the rocks a red argillaceous schist, down which flow several cascades. He was at the village of Pambete on the shore, and fixed the latitude at 8° 46′ 54″ S. This latitude is very important, as will presently be seen, because it furnishes independent evidence of the accuracy of Cameron's work. On February 14th, 1869, when very ill, Livingstone again reached Lake Tanganyika at a point on the west coast, under the escort of his Arab friend Muhammad Bugharib. The place was called Parra, at the confluence of the river Lofuko. He embarked on the 26th, but his illness was so severe that there was no attempt at an examination of the coast; and the voyage is described in half a page. Dr. Livingstone makes one remark of interest relating to the lake in this part of his journal. He says:—"Tanganyika has many deep bays running in 4 or 5 miles; they are choked up with aquatic vegetation, through which canoes can scarcely be propelled. When the bay has a small rivulet at its head, the water in the bay is decidedly brackish, though the rivulet be fresh; but as soon as we get out of the shut-in bay or lagoon into the lake proper the water is quite sweet, and shows that a current flows through the middle of the lake lengthways."

During his stay at Ujiji, Dr. Livingstone attentively observed the phenomena of the lake. He found that the water was encroaching on the eastern side, and that there was a current from south to north. The Ujiji Arabs were of opinion that all the water, both in the south and north, flowed into the lake, but where it then goes they have no conception. The current flows north from February to November. Evaporation is at its strongest in the south part in November, and there is a southerly current from November to February. The flow and reflow are the effect of the rains and evaporation. The floods of the great rains in February again drive the water north. But for the current, Dr. Livingstone believes that the lake would be covered with *tika-tika* or aquatic vegetation. He crossed the lake again to Kasenge Island in July 1869. On his last journey Dr. Livingstone skirted parts of the south-eastern shore of the lake. He first sighted it on October the 8th, 1872; and saw it at a distance again on the 11th. On the 13th he travelled along the top of a range of hills lying parallel to the lake, and 1000 feet above it, and he continued to skirt the shores until the end of November. In latitude 7° 52′ S. he gives the width of the lake at 12 or 15 miles.

Dr. Livingstone, in July 1869, seems to have held the opinion that Tanganyika has no outlet: for he says, were it not for the current, the water would be salt. In November 1871 he had not the slightest doubt that the lake discharged somewhere, and says that the outlet of the lake is probably by the Rogumba River into the Lualaba. But the Rogumba, or Logumba, certainly falls *into* the lake.

Such was the state of knowledge when Lieutenant Cameron reached Ujiji. Excepting that Dr. Livingstone had visited Pambete on the southern coast, and had skirted along a portion of the south-eastern side, often at some distance, the southern half of the lake from Urimba on the east side, round the south end, to Kasenge Island, near the western shore, was unknown, and required to be explored. Moreover, if there was an outlet at all, it must be somewhere along this unexplored coast-line of nearly 600 miles, for the northern half of the lake had been twice examined. There was a geographical discovery of the first importance to be made which was involved in the careful examination of the southern half of the lake, and Lieutenant Cameron has now achieved this discovery.

His first duty was to establish a good point of departure, by fixing the position of Ujiji, and, in the instructions given to him by Sir Bartle Frere, he was also specially enjoined to ascertain accurately the height of Lake Tanganyika above the level of the sea.

Lieutenant Cameron found the latitude of Ujiji, by meridian altitudes, to be 4° 58′ 3″ S., and by dead reckoning 4° 55′ 30″ S. His longitude of Ujiji, by lunar observations, is 30° 4′ 30″ E., by dead reckoning 29° 59′ 30″ E. The point of departure for the dead reckoning was at a distance of 200 miles, checked only by meridian altitudes, so that the results establish confidence in all the intermediate work. His observations for ascertaining the height of Lake Tanganyika above the level of the sea are by far the most complete that have ever been made either on or near any of those inter-tropical African lakes. On February 27th Cameron

observed, with seven of Casella's boiling-point thermometers, which gave the mean result as 207° 54′, and recorded the barometric height and temperature simultaneously. Next day he observed with two of the mercurial barometers, invented by our map-curator, Captain George, which he filled on the spot. He also observed with four aneroids, the results of which cannot yet be computed; but there was almost an exact agreement between the thermometer and barometer observations. The height of the lake proved to be 2710 feet.

Cameron's result is more satisfactory than any that had previously been obtained, because it was got by several methods; and this was the first time that a mercurial barometer had ever been used there. But it corroborates the general accuracy of Dr. Livingstone's former observation; and, in this instance, as well as in his survey of the lake, Lieutenant Cameron has done a service to the memory of his great predecessor, in having established the correctness of his work by independent evidence; for Cameron was entirely unacquainted with Livingstone's results. This consequence of his labours will give the young lieutenant, who suffered so much with the object of succouring Livingstone, even more pleasure than can be produced by the feeling that he has achieved a distinguished place as an African explorer.

Having thus carefully established a fixed point of departure, Cameron made preparations for his great work—the thorough examination of the southern half of Lake Tanganyika.

The voyage during which the survey was made, and the outlet discovered, is described in the articles at p. 1 of our number for January 1875, and at p. 71 of our number for March 1875. The latter article is illustrated by Cameron's map of the part of the lake explored by him.

The most interesting part of Cameron's survey is the discovery of the Lukuga outlet. Lieutenant Cameron himself is inclined to doubt the outflow being constant, and to think that, in the dry season, or when the lake is at its lowest level, little or no water leaves it. He, therefore, resolved to make a further and more extended examination of the Lukuga, on his way to the Lualaba; and by this time his intention no doubt has been carried out, although we may not receive the results for a long time. Meanwhile the various facts already recorded respecting the width and depth of the Lukuga, its current, the nature of the bars and sand-banks, the taste of the water, &c., will supply material for speculation and for interesting discussion, especially if they are considered in relation to the size and shape of Lake Tanganyika, and to its general hydrography. The difference of latitude between the northern and southern extremities of the lake is 5° 29′, or 329 miles, and the whole length something greater, while the width varies from 10 to 25 miles. The level of the lake is said to vary from 8 to 10 feet between the end of the rainy and the end of the dry season, and the rivers become much diminished in size. The current flows from north to south during two-thirds of the year, from February to November, and to the south from November to February, when evaporation is at its strongest at the southern end. Thus the general flow of the current is due to causes connected with the course of the seasons and with the winds, and is not influenced by the position of the outlet.

With these facts before us, it will be interesting to consider the phenomena described by Cameron in connection with the Lukuga. That it is an outlet is beyond dispute, for the current was observed to be flowing out, huge pieces of wood were being drifted down, and the rate was actually measured in a position clear of the wind. The question is, therefore, whether the outflow is permanent or temporary; and the first point is its sluggish character. The current was only flowing out at a rate of about a mile an hour, but this is no reason for doubting the permanency of the outflow. One of our most distinguished medallists recently pointed out that rivers flowing from lakes do not, as a rule, issue with strong currents, even though these rivers have, lower down, a very strong current, with rapids or falls. The Niagara River, in the words of Sir Charles Lyell, "glides along at first with a clear, smooth, and tranquil current." The St. Lawrence, too, issues calmly from Lake Ontario. The River Kirkaig, on the west coast of Sutherlandshire, when "in spate," issues from Lake Kirkaig with a trivial current, though afterwards it has a fall of 30 or 40 feet, and is a torrent nearly all the way to the sea. Its neighbour, the Inver, is another example of the same thing.

The fact of the existence of an accumulation, analogous to a delta, and of a bar at the entrance to the Lukuga, is another point for discussion. Ordinary bars are of course formed by the water of rivers flowing into a lake or sea meeting the opposing force of the waves. But the accumulations at the entrance of an outlet from a lake might, perhaps, have a different origin. At the season when the streams flowing into the lake bring down most grass, and when the outlet causes a set towards itself from the greatest distance, then the outlet would draw in the largest quantity of floating matter. When the waters of the lake subside, much of this accumulation would remain in the bay round the outlet, and give rise to the formation of such a morass as is described by Cameron. The authority whom I have already quoted mentions that the Amazon valley channels often get thus choked up in the season of floods. The sill or bar would be caused by the existence of a band of hard clay or rock.

There is the further evidence of the Lukuga being a permanent outlet in the fact that, while there are steep cliffs and mountains round almost every other part of the lake, here the mountains sink down into a plain on the north side very abruptly, and there is no high land visible in the distance in the direction of the Lukuga's apparent course. On the other hand, it may be that the outflow only takes place during a portion of the year. Instances are not infrequent of lakes which formerly had outlets, from which the water has ceased to flow, owing to the level having sunk in consequence of the lake receiving a much smaller quantity of water than formerly. There are also lakes, whose outlets were once rivers, but are now mere swamps, such as Lake Balaton in Hungary. Tanganyika may possibly be another instance. All these are subjects for discussion.

But the question whether Lukuga is a permanent or an intermittent outlet, can in no way affect the credit of its discovery. Lieutenant Cameron was himself doubtful on the subject, and is by no means committed to any theory. He has made a careful survey of the previously unexamined portion of the lake, and found ninety-six rivers flowing in, besides torrents and springs, and one, the Lukuga, flowing out. And he sends home his results, which he has zealously and carefully collected.

Those results are by no means confined to the geographical discoveries which have now been briefly submitted to you. His ethnological materials are also valuable, and his journal is full of notes descriptive of the people he encountered, of their personal appearance, dress, ornaments, and habits, arms, agricultural implements, method of spinning cotton and making pottery, and of their huts and granaries.

He also made an extensive botanical collection, which unfortunately got wet on the way down to the coast. However it has been submitted to Dr. Hooker, the President of the Royal Society, who finds that 101 specimens are fit for preservation, of which about a dozen are clearly new to science. These are all in a state which will admit of their being so described that they can be identified. About thirty-five were common African plants, and as such identifiable as they lay, and the names were catalogued. Dr. Hooker intends to send a notice of the collection to the Linnæan Society for publication; and he has expressed surprise that

Cameron could have done so much. "Had the collection escaped soaking," he adds, "it would have been a very fine one: as it is, it is very interesting, independently of the *flora* to which it belongs being otherwise utterly unknown."

Lieutenant Cameron has also sent home a small geological collection, which has been placed in the hands of Mr. Prestwich.

As regards our explorer's strictly geographical work, it may be summed up as follows:—

1st. He has discovered and explored two of the chief southern tributaries of the Malagarazi, and the chain of mountains on the right bank of the Sindy.

2nd. He has finally fixed the height of Lake Tanganyika above the sea, by observation of the mercurial barometer.

3rd. He has explored and made a careful compass survey, checked by meridian altitudes, of 560 miles of coast-line round the southern half of Lake Tanganyika.

4th. He has discovered the drain which connects the Likwa with the Tanganyika, and has fixed its position.

5th. He has discovered the outlet to Lake Tanganyika.

Lieutenant Cameron has thus done most valuable and distinguished service to geographical science, and the results are in your hands. In my opinion, he has proved himself to be an able, a diligent, and a careful explorer; undaunted by dangers, not to be deterred by illness or hardships, and admirably adapted, by his tact and kindliness, for the management of natives. I hope for your concurrence in this view. He has already rendered good service. He is now gallantly attempting to achieve one of the most hazardous and difficult exploits ever undertaken by an English traveller. That he may succeed, and that he may be restored to his country and his friends, must, I think, be the sincere and hearty wish of every geographer.

Sir BARTLE FRERE said all the Fellows of the Royal Geographical Society might feel proud of the young officer to whom they had entrusted so great a charge, and quite satisfied with what he had already done. It was worthy of note how closely he had complied with the instructions which were given to him. He was told to do all he could to complete and extend Dr. Livingstone's discoveries, and, instead of starting off upon any new will-o'-the wisp of his own he had steadily set himself to work to fill up the gaps in the work of his great predecessor. If he carried out what he had now undertaken, namely, the following up of the apparent outlet of the lake, whether he ultimately reached Colonel Gordon, by way of Albert Nyanza, or the Portuguese possessions on the West Coast, he would do a work which had very few parallels even in the great discoveries of African travellers. The Society might now hope, any day, to hear what he had been doing during the twelve months which had elapsed since his voyage around the southern half of Tanganyika. Mr. Markham had not in the least overstated the importance of his discoveries so far. Captain Burton had inclined to the opinion that this great lake was a volcanic depression, and no one who looked at its outline, as now for the first time presented, could fail to be struck by its extraordinary resemblance to the great American cañons, or the great rifts which Livingstone discovered further south. It seemed as if, in the raising of the continent, the upper strata had been torn asunder, and the edges left some 15 or 20 miles apart. The character of the sides, with the exception of the one apparent outlet, favoured that supposition; and he asked the members to recollect what Sir Frederick Goldsmid and his companions had stated with regard to those valleys in Mekran and Southern Persia, where a river after entering a valley, running almost across it, flowed a short distance along in its new direction, and found an outlet very much in the same direction as its original course. If they supposed one of those great valleys in Mekran or Southern Persia uplifted on its seaward side, it would produce just such a lake as Tanganyika, with, perhaps, an outlet over a depression towards the sea. This view might or might not be confirmed by further observation, but it was very curious that the facts ascertained by Lieutenant Cameron so far bore out what Captain Burton only suspected. Hardly sufficient weight had, he thought, been given to the possible effects of the continuous monsoon wind acting upon a long trough of such a character as Tanganyika. The great American engineer, Mr. Ellot, in his work on the Mississippi and Missouri, calculated the amount of elevation which might be given to a reach of a river 5 or 6 miles in length, by a continuous wind, and estimated it at as much as 8 inches on some of the reaches of the Missouri. Those reaches, of course, were very short when compared with the length of an immense trough like Tanganyika; and a monsoon, blowing almost directly either up or down such a trough, would produce such an elevation at either end as to reconcile the apparently contradictory statements of people who had observed it at different times of the year. Only a few months ago Sir Samuel Baker, at one of the meetings of the Society, stated his belief, founded on what the Arabs had told him, that occasionally, if not annually, there was a communication between the north of Tanganyika and the Albert Nyanza, and Mr. Major had more than once said that he could not help thinking that there might have been some foundation for the statements of old discoverers, 200 years ago, apparently on the evidence of the Arab and Negro traders of that day, that there was such a communication by a low morass, not always covered with water, but at times giving access from Tanganyika to the great lakes to the north. The facts stated by Lieutenant Cameron would, at any rate, enable geographers to suspend their judgment as to the theories of the old Portuguese discoverers, and prevent their being too dogmatic on the subject, for it was evident that, even without supposing any great variation in the rainfall, there might be a great difference in the height of the lake at the two ends. Mr. Markham had called attention to the various bars at the mouths of the rivers, but they must not be too sure that those bars either proved or disproved an inlet or an outlet, because all naval officers and harbour engineers would agree that a bar formed wherever there was a change in the direction, or in the rate of progress, of water laden with sand and silt. If during the prevalence of the wind, which had such an effect that the surf beat up the sand in the shallow waters near the coast, and carried it in a semi-suspended state along the bottom, the flow came to an outlet such as that in which Lieutenant Cameron had sheltered in still water, the sand would be deposited and a bar would be formed, whether the water was flowing out or in. Here again was another reason for suspending judgment until further information was received. The facts that had been mentioned with regard to the heavy drifts were very much in favour of a great outlet, and the conditions appeared to be very similar to those described by Sir Samuel Baker and Colonel Gordon as existing on the northern outlets of the Albert Nyanza. All these things showed how much yet remained to be ascertained before it could be said with certainty that the true theory of the Tanganyika had been ascertained; but there could be no doubt as to the great amount of information which had been obtained by Lieutenant Cameron, who well deserved all the praise which had been given to him.

The Rev. HORACE WALLER said he had hoped that Lieutenant Cameron's map and notes would have passed into the hands of the Royal Geographical Society, but he regretted to find that other means had been taken to make them public. The map was not yet in the hands of the subscribers, though it had appeared in the *Geographical Magazine*, a private periodical.*

* It is quite unusual for the Geographical Society to publish maps in the *Proceedings*, or to place copies in the hands of subscribers before the appearance of the *Journal*, in the year following

The PRESIDENT interposed by remarking that the Geographical Society considered the *Geographical Magazine* a very valuable auxiliary in communicating early geographical information to the public. The Geographical Society was not a publishing or a mercantile establishment. It was simply instituted for the purpose of obtaining and circulating geographical information, and was very much indebted to any journal or individual which assisted in giving publicity to anything which was novel or interesting in a geographical point of view.

Mr. FRANCIS GALTON said that, some twenty years ago, the well-known phenomenon known as the Séche, in Switzerland, attracted considerable attention. When a violent wind was blowing, a difference of level between the two ends, of no less than 2½ feet, might be produced in the little Lake of Geneva. In a lake of such magnitude as Tanganyika therefore the difference might be very considerable. All who had watched Lieutenant Cameron's expedition must extremely rejoice that, after all the misfortunes and delays that occurred in the early part of it, it should have been reserved for Lieutenant Cameron to discover what appeared to be the outlet of the lake, and to establish implicitly that the head-waters of the Congo were the Malagarazi River.

Dr. PERCY BADGER said that Lieutenant Cameron had called upon him before he set out upon his expedition, and asked him regarding the best way of getting on with the Arabs. The advice which he (Dr. Badger) gave, was "Keep your temper." At Zanzibar he inquired frequently of the Arabs what they thought of Cameron, and the reply invariably was, that he was the most kindly-dispositioned and generous man they had ever met with.

The PRESIDENT remarked that Lieutenant Cameron himself had never put forward a positive claim to having discovered the outlet of Tanganyika. In his journal he gave the *pros* and *cons* with the most perfect sincerity and impartiality. He would willingly have convinced himself that the Lukuga was the outlet, but he constantly heard adverse rumours, and in the journal which had been sent home he really left the question doubtful. By the last accounts he was proceeding to satisfy himself whether it really was an outlet into the Lualaba, or merely into some lagoon which interposed between Tanganyika and the Lualaba. The only place south of Kasenge where such an outlet could be, was just where Lieutenant Cameron had found the Lukuga, where the coast was depressed, and where there was apparently a natural opening in a south-west direction, leading, as the Arabs said, to the Lualaba, between the lakes Moero and Kamalondo. The natives, too, told Lieutenant Cameron that they passed by that outlet, *i.e.* along the banks, to the Lualaba and Nyangwe. It was, however, still a doubtful point, and could not be settled until further information was received from Lieutenant Cameron. It could hardly be expected that he had followed the west shore of the lake from Kasenge to the north; for by the last accounts his intention was to proceed to Manyuema, and thence to follow the Lualaba to its outlet—whether north to the Albert Nyanza, or west to the West Coast of Africa. It was now ten months since he started on his journey from Ujiji, and if he had found that the Lualaba was the Congo, he ought by this time to have reached the Yellala Falls. At any moment, therefore, definite intelligence of his whereabouts might be expected. It was satisfactory to know that both the Foreign Office and the Admiralty had sent out instructions to all the naval and consular officers on the West Coast of Africa to look out for him, and to endeavour to obtain news of him from the traders who came to the coast from the interior. If they met him they were directed to give him every possible assistance, and to send him with all speed and despatch to his native land.

their receipt. It was, as a special case, resolved that Cameron's map should appear in the *Proceedings*, and it would in the ordinary course have appeared before the publication of our March number, in which a similar map, but with various additions, and on a different scale, illustrates the article on Cameron's survey. There was some delay in the issue of this number of the *Proceedings*, but it has long since been supplied to Fellows of the Society.

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IMPERIAL RUSSIAN GEOGRAPHICAL SOCIETY.

THE usual monthly meeting of the Society was held on the 5th (17th) of February. After enumerating the most important additions to the library during the preceding month, M. Wilson, the Secretary, referred to the work of M. Chekanofsky, in Northern Siberia, allusion to which has more than once been made in our columns. M. Chekanofsky's expedition was prolonged last summer for the space of a year, in order to give him an opportunity of studying the water-system of the Khatanga and Anabara Rivers, as well as the *tundras* or frozen marshes between the Lena and Yenisei Rivers. On his return to Irkutsk, however, M. Chekanofsky represented that he stood in need of further assistance from the local authorities, and that a year was insufficient for the completion of his proposed researches. The council were of opinion that the material collected on the occasion of the first journey to Olenek and Lower Tunguska stood in need of being arranged and utilized first of all, and with that view the projected journey to the Khatanga and Anabara was abandoned, half the amount voted on that account being credited to the reserve fund, and half to the utilization of the former results. A silver medal was awarded to a Cossack petty officer, who had despatched a vessel at his own expense down the Anabara to co-operate with the expedition.

M. WILSON then announced that the council had arranged for the execution of some levelling work in Siberia. The plan of operations had not yet been fixed; the work, however, will be under the direction of M. A. Thilo, and will be carried out with instruments of a high degree of accuracy, as in Switzerland. Similar instruments were used for the first time in Russia, in the levelling between Aral and the Caspian, and the results are thoroughly reliable. The finances of the society do not, unfortunately, admit of their contributing largely to this undertaking; it therefore appeals to the public, and thankfully acknowledges some aid already tendered.

With reference to the approaching Geographical Congress in Paris, His Imperial Majesty had announced his wish to send for exhibition in the ethnographical section a unique collection of Khivan ornaments and precious stones.

M. JILINSKY then read a paper on the proposed desiccation of the marshy region in Pinsk. These marshes extend between Mohilef, Brest-Listofsk, and Kief in the form of a triangle of about 80,000 versts in extent, or an area seven times as large as that of Saxony, and four times that of Belgium. The lecturer then described the economic, sanitary, and hydrographic features of the marshes, and ascribed their existence to the vicinity of the points of confluence of the Pripet, Goryna, Slouch, Styra, Stakhod, Tuva, and Yassobia Rivers, which frequently inundate the adjoining country for a continuous distance of 20 versts. A secondary cause may be found in the frequent mill-dams and fish-weirs which occur. During the summers of 1873 and 1874 M. Jilinsky levelled over about three-quarters of the whole region, examined the currents and depths of the streams, and their annual rises. He also made some experiments in the drainage of a tract between the Pripet, Dnieper, and Beresina, which tract is traversed by an affluent of the Dnieper—the Vedretch—the course of which is obstructed by mills and weirs, and the waters are thus forced above its banks. By the

construction of drainage channels, the water was carried off, and an area of 120 square versts reclaimed. Two other equally successful experiments were made; one close to Lake Jid, which proved to be higher than the River Pripet, the intervening ground having a slope of about 1 in 250. The whole of the superficies of the province of Minsk has a slope of from 3 to 5 in 1000, which would admit of the waters being rapidly carried off by canals into the Pripet and Dnieper, a measure which will most materially benefit the forest vegetation, which at present suffers from excess of humidity.

M. Jilinsky's paper was listened to with deep interest, and after the announcement of the election of some new members, the meeting broke up.

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VIENNA GEOGRAPHICAL SOCIETY.

AT the meeting of the Society held on the 23rd of February, under the presidency of Dr. Ferdinand von Hochstetter, it was announced that Lieutenant A. E. Lux, who is to accompany Captain Homeyer to the African coast, in the capacity of surveyor, had already started from Liverpool. These two gentlemen are attached to the German African Expedition, and propose to penetrate into the interior from some point on the coast south of the Congo.

Letters were also read from Consul Hansal, at Khartum, and from Herr Marno, on his way to join Colonel Gordon's Expedition. The former stated that Lieutenant-Colonel Long had arrived at Khartum, after having visited the region of the White Nile, and having been hospitably received by King Mtesi, who presented his guest with six female attendants, one of whom was Mtesi's own daughter, a young woman of the Gallas type, and quite different from the negro race. Mtesi made many protestations of friendship and promised to divert the ivory trade from the Zanzibar route towards Gondokoro. Long found that the Victoria Nyanza was no more than 15 miles across, and in latitude 1° 30' N. he discovered a smaller lake, probably connected with the former. He experienced a friendly reception at the hands of Rionga, a chief with whom Sir S. Baker had left a garrison, but was attacked by the king of Unyoro, at the head of four hundred savages, who were fortunately routed with a loss of eighty-two slain. Long was away altogether six months, and was made by the Khedive a full colonel for his exploits, besides receiving the order of the Medjidie (3rd class). Abu Saood, Baker's old friend, has fallen into disgrace through concocting some intrigues with two other officials. Gordon promptly discovered the plot and packed off the mutineers forthwith.

Herr Marno* writes from Fashodah, on board the Khedive steamer, to the effect that at Suakin he was provided by order of the Viceroy with camels for his journey to Berber, and with everything else he could possibly require. Berber was left on the 19th of November, and five days' steam brought them to Khartum. The steamer is one built by Baker in Gondokoro for navigating the Albert Nyanza with. It is very small, uncomfortable, and the engine fires emit sparks to a dangerous extent, so that men have to be constantly on the watch on board to extinguish incipient fires. On the 5th of December a steamer was met coming down with M. Cechi, one of Colonel Gordon's party, on board, and he brought news that Gordon himself was established at a new-named Fado, situated on some hills of Gondokoro. A messenger had been sent to King Mtesi and the two English engineer officers, Messrs. Watson and Chippendale, to the westward, presumably to explore, while a steamer was being put together at Fabo, so as to be launched on Lake Albert. Herr Marno, in conclusion, announced his intention of going on to Fabo.

After reading the above letters, Baron Hofmann gave a sketch of Gordon's plan of operations, as gathered from the intelligence received. The object is evidently the overthrow of the Unyoro kingdom, and the attempt to extend the Egyptian dominion beyond the equator. To this end an alliance is being contracted with Rionga, who occupies both sides of the Victoria Nile, and a treaty with Mtesi of Uganda, so as to facilitate flank operations, while important help will be rendered by the steamer being built at Fabo, a former slave station, and which, being above the cataracts, is in direct communication with the Albert Nyanza. Baron Hofmann concluded with an enumeration of the interesting geographical problems which await solution at the hands of this expedition.

* See *Geographical Magazine*, for January, 1875, p. 23.

JOURNEY OF DR. E. TIETZE IN GHILAN AND MAZANDERAN.

THE provinces of Ghilan and Mazanderan comprise the wooded northern slopes of the Elburz range, and a flat strip of coast land of unequal width between it and the Caspian. This marshy and fever-breeding tract, where rice, cotton, silk and a little sugar is produced, is like the neighbouring mountain slopes, densely wooded in parts, and thus presenting a striking contrast to the bare desert-like land south of the Elburz range. In the mountain forests beeches prevail, and in the lowland lofty oaks, mimosa and other trees; vines and pomegranates grow wild, the box tree attains a height of from 20 to 30 feet, while reeds and creepers form a shelter to the tiger, and deer; boars and pheasants are common game.

In this lowland the geological features are of course of but slight interest. There is a clear proof of the sea having formerly extended to the foot of the mountains in the presence of a steep rocky bank by Ashref, which bears the imprint of the lashing of the waves. About a league and a half east of Puli Nika there are salt springs in a chalk formation, which can only be accounted for by the former presence of the sea. There is also proof that the different tracts which at present go to make up the Mazanderan lowland were formerly separated one from another by arms of the sea, and not by streams as at present.

At Sari a road, which for a portion of the way is a beaten causeway, leads northward to Farahabad, where there are the ruins of a castle of the time of Shah Abbas. A little beyond one comes upon the mouth of the Tedshen River, and a small fishing village called Wateke, situated on its left bank. The coast is marked with sand-dunes and lagoons, and frequented by crows, mews, ducks, cranes, and other birds. The quantity of drift-wood brought down by the mountain streams and deposited on the coast is very considerable (a fact already recorded by Grewingk and Bell), while the mud in spring time colours the sea to a distance of from 5 to 6 English miles from the shore.

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